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MEDICAL FITNESS FOR AIR TRAVEL

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Those who are not well acquainted with the physiological problems of flying, particularly of long flights on a world-wide basis, doubtless find difficulty in assessing the fitness of certain individuals for air travel. To help the practitioner to advise on such cases as may be referred to him a tabulated statement has been prepared, based on experience gained in commercial and Service aviation, especially in connexion with the transport of casualties during and since the war.

In the first column of the accompanying Table the commoner medical conditions on which an opinion is likely to be required regarding suitability for air travel are listed and arranged in alphabetical order for ease of reference. In the second column the limiting factors of the disease are given: any person whose condition falls below the standard set here should be advised against travelling by air, except possibly on short flights of about an hour's duration at low altitudes under good flying conditions. Essential facilities to be provided and precautions to be taken by the passenger concerned during flight are indicated in the third column, and in the fourth column there is a note on the advisability of air travel for those suffering from each disease in question.

The advice given in the Table is in general terms and is particularly applicable to flights of over four hours' duration in public air transport flying at altitudes between 5,000 and 9,000 ft. (1,524 and 2,743 m.) and for short times at 15,000 ft. (4,572 m.) or above to circumvent a bad weather front or to avoid high ground. When the journey is by pressurized aircraft it can be assumed that the air condition of the cabin will be similar to that of an altitude of 8,000 ft. (2,438 m.) with respect to atmospheric pressure and oxygen content even if the aircraft is actually flying at 20,000 ft. (6,096 m.). The proportion of passenger aircraft which are pressurized is steadily increasing, so that in a year or two most will be of this type. Certain cases which might be rejected for public air transport might be acceptable in an air ambulance or in a privately chartered aircraft where the patient's condition would cause no offence to fellow passengers and the altitude and length of each stage of the flight could be arranged to suit the patient.

Every case must be assessed on its merits, bearing in mind the following points: (1) the medical condition and psychological make-up of the patient; (2) the effect of the patient's disability on fellow passengers; (3) the necessity or otherwise for a qualified attendant to travel with the patient; and (4) the conditions of air travel—that is, (*a*) the type of aircraft, particularly whether it is pressurized or not; (*b*) the length of the journey envisaged and the duration of the various stages, which may be as long as 10 hours when crossing the Atlantic; (*c*) the expected weather conditions at the time of the year, and the altitudes likely to be attained; and (*d*) the availability of oxygen.

Limiting Factors and Precautionary Measures

Though modern air travel is very comfortable and acceptable to the vast majority of invalids, long flights may be fatiguing even to the robust.

Patients with anaemia, even of moderate degree, suffer from anoxia at the altitudes usually flown by civil airlines, and they should have a blood transfusion to bring the haemoglobin above 50% (7 g. per 100 ml.) if an air passage is essential. Patients with acute leukaemia should not travel by air, as they readily suffer from anoxia, and haemorrhage is likely to occur with the lowered oxygen tension at altitude. If it is essential to transport such cases they should be given a blood transfusion to raise the haemoglobin level to 80%. Chronic types with pronounced splenomegaly experience respiratory distress.

Individuals who have cardiac and pulmonary lesions are apt to react badly to effects of low pressure, even at altitudes below 10,000 ft. (3,048 m.), particularly those who have had attacks of angina pectoris or coronary occlusion, as well as cardiac and renal asthmatics, chronic bronchitics, and those suffering from pulmonary tuberculosis, especially refill cases.

Patients with active tuberculosis should not travel by air unless their sputum is free from tubercle bacilli and any cavity is controlled by collapse therapy, but not within a week of a refill. If the mediastinum is fixed, the lung must be at least three-quarters expanded. Pneumo-peritoneal refill cases should not have more than

Medical Contraindications to Air Travel

Condition	Limiting Factors	Essential Facilities and Precautions in Flight	Whether Advisable to Travel by Air
1. Blood and Lymphatic System Diseases			
(i) Anaemias	Less than 3,000,000 R.B.C. per c.mm.; less than 50% Hb. (May need transfusion before flight)	Maximum altitude 5,000 ft. Oxygen must be available	Inadvisable unless aircraft is pressurized to 5,000 ft.
(ii) Leukaemias	Less than 3,000,000 R.B.C. per c.mm.; less than 50% Hb. Gross enlargement of spleen. Haemorrhages. (May need *x*-ray therapy before flight, which should not be within 4 weeks of the *x* rays)	Maximum altitude 5,000 ft. Oxygen must be available	Acute cases should be rejected, unless Hb is raised to 80% by a blood transfusion. Chronic cases inadvisable unless aircraft is pressurized to 5,000 ft.
(iii) Lymphadenoma	Enlargement of mediastinal lymph glands revealed by *x*-ray film. Fever of the Pel-Ebstein type	Oxygen must be available	Cases to be considered on their merits
2. Cardiovascular Diseases			
(i) Angina pectoris	Frequent or recent attacks. Electrocardiogram to exclude coronary occlusion	Maximum altitude 5,000 ft. Oxygen must be available. Movement in aircraft should be limited to minimum	Inadvisable unless in aircraft pressurized to 5,000 ft., and attacks provoked only by brisk walk of about ½ mile
(ii) Coronary occlusion	Symptoms within 12 months	Maximum altitude 5,000 ft. Oxygen must be available. Movement in aircraft should be limited to minimum	Inadvisable unless in aircraft pressurized to 5,000 ft.
(iii) Valvular lesions			
(*a*) Compensated	Degree of anaemia	Maximum altitude 8,500 ft. Oxygen must be available	If flight is under 8,500 ft.
(*b*) Uncompensated	Signs of congestive failure	—	Reject
(*c*) Congenital	Evidence of veno-arterial shunt (cyanosis), heart block, or severe hypertension	Maximum altitude 8,500 ft. Oxygen must be available	If flight is under 8,500 ft.
(iv) Myocardial lesions	Active disease or bradycardia. In post-diphtheria cases 6 months must have elapsed since illness	Maximum altitude 5,000 ft. Oxygen must be available	Cases to be considered on their merits
(v) High blood pressure	B.P. 200/120 mm. Hg or above. Headaches or loss of weight. Pulsus alternans. Cardiac asthma. Unsatisfactory condition of optic fundus. Albuminuria more than 2%. Cellular casts in urine	Maximum altitude 8,500 ft. Oxygen must be available	Inadvisable except in pressurized aircraft
3. Diabetes	Other than moderate types without cardiovascular disease, which must be stabilized by diet or insulin. Should have a recent blood-sugar estimation and report. Fasting blood-sugar level should be below 250 mg. per 100 ml.	Must adhere strictly to prescribed hours of meals and insulin injections. Not to move about at altitude more than necessary. Oxygen must be available. Hyoscine to prevent air-sickness	Only milder and moderate cases acceptable—that is, those not needing more than 50 units of insulin a day
4. Elderly	Unsatisfactory cardiovascular condition. In the case of a patient over 65 who is undertaking a long flight, it is advisable that a medical examination be carried out to eliminate anaemia or cardiovascular conditions. An electrocardiogram may be necessary where doubts exist	Not to move about at altitude more than is necessary. Oxygen should be available in non-pressurized aircraft	Depends on physical condition. Pressurized aircraft advisable (maximum altitude 8,500 ft.) for the very elderly
5. Gastro-Intestinal Diseases			
(i) Peptic ulcer			
(*a*) Quiescent and old perforation	As proved by absence of: (i) symptoms of activity; (ii) occult blood in faeces; (iii) *x*-ray evidence of active disease; (iv) proneness to travel sickness	Not over 8,500 ft. Hyoscine to prevent air sickness. Carminatives for flatulence	Preferably by pressurized aircraft (8,500 ft.)
(*b*) Active	Pain. Occult blood in faeces. *X*-ray evidence. Proneness to travel sickness	Not over 5,000 ft. Limit movements in aircraft. Hyoscine to prevent air-sickness. Carminatives for flatulence. Follow dietetic advice	Normally reject. Pressurized aircraft if journey essential
(ii) Post-operation			
(*a*) Appendicectomy	At least 10 days must have elapsed since the operation	Not over 8,500 ft. shortly after operation. Hyoscine to prevent air-sickness	Flight should be under 8,500 ft.
(*b*) Herniotomy	At least 10 days must have elapsed since the operation	Not over 8,500 ft. shortly after operation. Hyoscine to prevent air-sickness	Flight should be under 8,500 ft.
(*c*) Other resections and wounds	Depends on condition of gut, fluid in abdomen, etc. Unable to go to lavatory unaided	Not over 5,000 ft.	Inadvisable except at 5,000 ft. maximum in pressurized aircraft
(*d*) Colostomy	Effect on fellow travellers	—	Reject
(iii) Haematemesis and melaena	—	—	Reject
6. Genito-Urinary Diseases			
(i) Calculus	If attacks of renal colic are frequent	Hyoscine to prevent air-sickness	Normally acceptable
(ii) Nephritis	Systolic blood pressure over 200 mm. Hg. Degree of anaemia (see Anaemia). Ascites or hydrothorax. Unsatisfactory condition of optic fundi. Albuminuria more than 2%. Cellular casts in urine. Blood urea more than 60 mg. per 100 ml.	Maximum altitude 8,500 ft. Oxygen should be available	Normally acceptable, but consider each case on its merits
(iii) Venereal	Must be free of active lesions, especially those of skin or buccal infections	—	Reject till non-infectious
7. Infectious Diseases	While infectious	—	Reject
8. Liver Diseases			
(i) Abscess	Those liable to burst	Maximum altitude 8,500 ft. Oxygen must be available	Normally reject. If essential, travel below 8,500 ft.
(ii) Cirrhosis	Evidence of congestive failure. Haemorrhages. Ascites or hydrothorax	Maximum altitude 8,500 ft. Oxygen must be available	Normally reject
9. Mental and Nervous Conditions			
(i) Brain tumours	Pressure symptoms. Incontinence	Maximum altitude 5,000 ft. Doctor or nurse in attendance	Normally reject
(ii) Epilepsy	Frequently occurring fits	Attendant advisable. Suitable sedative. No alcohol	Inadvisable except in milder cases
(iii) Mental disease	Non-quiescent state. Lack of control of bowel and bladder. Homicidal or suicidal tendencies	Attendant essential. Calmed with suitable sedative	Normally reject
(iv) Poliomyelitis	Not less than one month after onset (i.e., must be non-infectious). Unable to walk to lavatory. Respiratory involvement during illness	Attendant, if patient is not freely mobile. Oxygen must be available	Acceptable
(v) Other palsies	Lack of control of bowel and bladder. Unable to walk to lavatory	Attendant, if patient is not freely mobile. Oxygen must be available	Decide each case on its merits

Medical Contraindications to Air Travel—*(continued)*

Condition	Limiting Factors	Essential Facilities and Precautions in Flight	Whether Advisable to Travel by Air
10. Pregnancy	Must not be beyond 8th month of pregnancy. Evidence or history of repeated or threatened abortion, eclampsia, or travel sickness	Ensure that retention belt is round pelvis, not abdomen, at take-off and landing. Sit in backward-facing seat, if available. Oxygen must be available. Hyoscine to prevent air-sickness	If medical certificate is satisfactory and weather conditions are favourable for smooth flight at altitudes under 9,000 ft. Oxygen available. Pressurized aircraft advisable
11. Respiratory Diseases			
(i) Asthma	Severe attacks. Cardiac or renal basis	Maximum altitude 5,000 ft. Oxygen must be available. Move about as little as possible	Consider each case on its merits
(ii) Emphysema and bronchitic conditions	Dyspnoea. Cardiac lesion. Offensive sputum	Maximum altitude 5,000 ft. Oxygen must be available. Move about as little as possible	Normally reject. Consider each case on its merits
(iii) Fibrosis of lungs	Extensive	Maximum altitude 5,000 ft. Oxygen must be available. Move about as little as possible	Normally reject. If essential, travel in aircraft pressurized at 5,000 ft.
(iv) Lobectomy and pneumonectomy	Must be more than 3 months since operation. Breathlessness on moderate exertion	Maximum altitude 5,000 ft. Oxygen must be available. Move about as little as possible	Normally reject. If essential, travel in aircraft pressurized at 5,000 ft.
(v) Pleurisy (*a*) Dry	Pain and extent of lesion. Fever	Maximum altitude 5,000 ft. Oxygen must be available. Move about as little as possible	Normally reject. If essential, travel in aircraft pressurized at 5,000 ft.
(*b*) Wet	If one side of chest is more than half filled. (Tap if necessary)	Maximum altitude 5,000 ft. Oxygen must be available. Move about as little as possible. Doctor or nurse in attendance	Normally reject. If essential, travel in aircraft pressurized at 5,000 ft.
(vi) Pneumonia	Must be more than a month since recovery	Maximum altitude 5,000 ft. Oxygen must be available. Move about as little as possible	Normally reject. If essential, travel in aircraft pressurized at 5,000 ft.
(vii) Pneumothorax (artificial) ..	Refill must have been done more than 7 days ago. Degree of displacement. If mediastinum is fixed, lung must be not less than three-quarters expanded. Bilateral involvement	Maximum altitude 5,000 ft. Oxygen must be available. Move about as little as possible	Normally reject. If essential, travel below 5,000 ft.
(viii) Pneumoperitoneum ..	Refills must not be more than 2,000 ml. at each site, and must have been done more than 7 days ago	Maximum altitude 5,000 ft. Oxygen must be available. Move about as little as possible	Normally reject. If essential, travel below 5,000 ft.
(ix) Tuberculosis (*a*) Active	Danger of haemoptysis and spread of infection	Maximum altitude 5,000 ft. Oxygen must be available. Move about as little as possible	Reject unless sputum is free from tubercle bacilli, or any cavity is controlled by collapse therapy
(*b*) Healed	As proved by: (i) Recent examination of sputum showing no evidence of tubercle bacilli. (ii) *X*-ray film of lungs. (iii) Clinical condition	Maximum altitude 8,500 ft. Oxygen must be available	Acceptable if flight below 8,500 ft. can be guaranteed
12. Tumours	Depends on site and presence of metastases and nature of complications	As required by symptoms	Depends on case

2,000 ml. of air introduced into each site. Moreover, the altitude of the flight should never exceed 5,000 ft., and oxygen must be available for immediate use in all pulmonary disease cases, whether tuberculous or otherwise. Lobectomy and pneumonectomy cases do not travel well by air, especially within three months of operation: normally they should be rejected, the degree of breathlessness on exertion being a good guide

Those suffering from angina pectoris must have the condition adequately controlled with trinitrate, and an electrocardiogram should be done to exclude infarction: such cases can be accepted if the angina is provoked only by a brisk walk of half a mile. Cases with congenital heart lesion can be accepted for low-altitude flights if there is no veno-arterial shunt as evidenced by cyanosis, or if there is no heart-block or severe hypertension resulting from coarctation of the aorta. Cases of high blood pressure are acceptable if the systolic pressure is not over 200 mm. Hg and the diastolic is less than 120, provided they have flown before and there is no pulsus alternans, cardiac asthma, gross albuminuria, or cellular casts in the urine: those who have not flown before may be upset by nervous tension.

Diabetics in whom the level of the fasting blood sugar is higher than 250 mg. per 100 ml. should not travel for long distances by air or at altitudes greater than 8,500 ft. (2,590 m.). Acceptable cases should be fully stabilized and keep strictly to the clock in respect of insulin and meals. They should not alter the time by their watch during the flight, but inform the chief steward of their hours of meals and their diet requirements, and have by them an adequate supply of sugar to take in the event of air-sickness. They can adjust their diabetic life to the change of time on arrival at their destination.

Elderly persons travel well at altitudes up to 10,000 ft., provided they are free from organic disease; it is advisable, however, that oxygen should be available, and where possible they should journey in a pressurized aircraft. In cases of doubt an electrocardiogram should be taken. Obese persons should be examined carefully to assess whether the fatty changes have affected the cardiovascular system, and advised accordingly.

Those with active ulcerative conditions of stomach or intestines should be warned against air travel owing to the danger of gaseous distension causing a haemorrhage or perforation. Cases of perforation or haemorrhage of the gastro-intestinal tract should not travel by air within two months of the occurrence, then only at an altitude not greater than 5,000 ft. It is essential in public air transport that all passengers should be mobile enough to go to the lavatory, aided by an attendant if necessary. Colostomy, urinary incontinence, and other odorous cases are obviously unacceptable in the confines of a public aircraft. When nephritis is present it is necessary to exclude severe anaemia, gross albuminuria, ascites, and hydrothorax before advising air travel. Infectious cases are rejected for obvious reasons. Those with cirrhosis of the liver should be rejected if there is evidence of congestive failure, haemorrhage, ascites, or hydrothorax.

Mental patients are not accepted normally, as their presence would worry the passengers and aircrew: when transported by air, they must be in a quiescent state vouched for by a mental specialist, and be accompanied by a doctor or nurse with suitable sedatives. Flying at altitude may precipitate fits in epileptics, so that only mild cases are acceptable: it is important that they should not take alcohol. Paretic cases must have full control of their bowels and bladder, and be able to walk to the lavatory,

aided if necessary. Hyperthyroidism of moderate degree is not adversely affected by air travel unless there is fear of flying, in which case sedatives should be prescribed: those with auricular fibrillation should not fly. Would-be travellers suffering from acute inflammations of the upper respiratory tract, or of the middle ear, should not fly until after the condition has subsided, as the changes in atmospheric pressure may lead to spread of infection to the paranasal sinuses and the middle ear. Those with chronic blockage of the paranasal sinuses or Eustachian tubes are unable to adjust the air pressure in their middle ears during descent, and should be advised not to fly.

It is important that expectant mothers should undergo a medical examination and obtain advice before undertaking a journey by air, and that the doctor consulted should know the proposed flight plan, its expected duration, and the altitudes likely to be attained. The difficulties of attending to a confinement or an abortion while in flight will be appreciated, so that the question of the date of expected delivery and the possibility of abortion must be carefully assessed. International airlines accept pregnancy cases up to the eighth month provided they are in good health and that oxygen is available, whether the aircraft is pressurized or not. It is important to be assured that reasonable weather conditions are forecast to avoid the danger of air-sickness or the need to use a retaining belt except at taking off and landing. Pregnancy cases should sit in backward-facing seats where these are available, so that the retention belt need not be tight at taking off and landing. They should be instructed to place the belt as low down as possible on the abdomen—just above the groins.

Children, infants, and babies travel well by air, but need oxygen at the same altitudes as do healthy adults. It is difficult to instruct very young children and babies how to equalize the pressure on either side of the ear drums on descent from altitude, so mothers should be told to feed a baby during descent and to give an older child a sweet to suck or some gum to chew to open the Eustachian orifice. If this is not done there will be pain in the ear and the child will cry: crying fortunately opens the orifice and relieves the condition.

Prevention of Air-sickness

Air-sickness is not a common occurrence in civil passenger flying, unless in "bumpy" weather. It is important, however, to take steps to prevent diabetics, expectant mothers, and those suffering from gastro-intestinal diseases (including post-operation cases) from being air-sick. The best preventive measure is to give hyoscine hydrobromide (1/100 gr.—0.65 mg.)* by mouth about an hour before flight, and to repeat this two hours later if necessary: for children the dose should be 1/200 gr. (0.32 mg.). Patients should be so advised and informed that after the first stage of the journey they will probably become acclimatized to flying and will not need any more tablets, unless bumpy weather is encountered. These anti-air-sickness tablets can be obtained from flight stewards and stewardesses in aircraft.

A number of factors predispose to air-sickness, such as fatigue, type of meal, noise, vibration, and cold. Advice should therefore be given regarding the need for sound rest the night before a flight, proper evacuation of the bowels, a light meal about an hour before taking off, and small light meals during the trip. In addition, those prone to travel sickness should wear suitable clothing so as to be warm but not overheated and should protect their ears against aircraft noise by means of moistened cotton-wool plugs as provided on board. If they feel sick during flight they should be advised to relax and lie back in their seats, looking upwards, so as to minimize stimulation of the sensory hairs of the utricles by the otoliths (see Diagram).

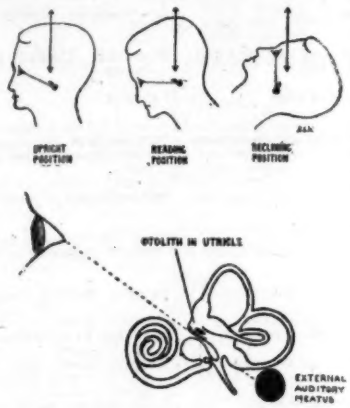

Diagram to show position of otolith in the utricle in relation to vertical movements when the head is in various positions. Repeated vertical movements, whether accompanied or not by swaying, press the otolith on the sensitive nerve filaments in the floor of the utricle, leading to excessive stimulation and probably to travel sickness.

Travel Regulations

For international air travel the passenger has to carry certain inoculation certificates, depending on the destination and the countries to be traversed. The would-be traveller must have been vaccinated against smallpox within one to three years, and, if the journey is to be through a yellow-fever zone, immunized against that disease. Moreover, some countries still insist on inoculation against typhoid, typhus, plague, and cholera. Details of immunization requirements can always be obtained from the Medical Department, British Overseas Airways Corporation, Stratton House, Stratton Street, W.1 (tel.: Mayfair 6611, extension 134): these are published periodically in tabular form in the *British Medical Journal* under the heading "Air Travel." These requirements must be borne in mind when advising a patient regarding travel as the immunizing procedure may have an adverse effect on the patient's condition.

The doctor concerned should see that the patient has all drugs and appliances necessary for the journey, and that he or she fully understands any action necessary *en route*. To this end, instructions should be written clearly. Apprehensive individuals and those who sleep badly when travelling should be given a sedative, which also will help to ward off travel sickness. If desired, the drugs and appliances can be handed to the chief steward of the aircraft for custody and control of medication. Air stewards and stewardesses have had a training in first aid and are normally in charge of the first-aid outfits. Any medical attendant or nurse required to accompany the patient must be provided by the passenger.

In any case of doubt the medical practitioner is advised to consult the appropriate airline medical authority—B.O.A.C., Stratton House, Piccadilly, W.1 (tel.: Mayfair 6611); B.E.A., Northolt Airfield, Middlesex (tel.: Ruislip 6061); B.S.A.A., Dr. J. C. Macgown, 21, Wimpole Street, W.1 (tel.: Langham 3243). To help the authority to make

*"Dramamine" (β-diaminoethyl benzohydryl ether 8-chlorotheophyllinate) is claimed by the Army Medical Department of the U.S.A. to be more efficient than hyoscine.

a decision the medical practitioner should provide a statement covering the following points:

1. Name, age, address, and telephone number of invalid.....
.....
2. Diagnosis of condition.....
3. Manifest symptoms .....
4. Severity of disability (mild, severe)*.....
5. Whether infectious or non-infectious.....
6. Where under treatment—if in a hospital or nursing-home.....
.....
7. Nature of treatment.....
8. Whether treatment effectively controls symptoms.....
9. Whether treatment is necessary during the air journey.....
10. Whether an attendant is necessary.....
11. Whether patient can walk unaided.....
12. Whether patient can travel in sitting position.....
13. Any other points.....
14. In my opinion.....is fit to travel by air from..... to.....

Signature of doctor .....
Address and Tel. No. .....
.....
.....

*Clinical findings referred to in a Table as possible limiting factors, including the systolic and diastolic blood pressures, should be recorded.

THE PHYSIOLOGICAL BASIS OF VAGOTOMY

BY

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The surgical treatment of peptic ulcer has recently become a matter of some controversy. The place held so long by subtotal gastrectomy in the treatment of all types of gastro-duodenal ulceration is now being challenged by vagotomy, and it is therefore of some importance that the physiological principles underlying the newer procedure should be generally appreciated.

Aetiology of Peptic Ulcer

There is little fundamental difference between the factors primarily responsible for gastro-duodenal ulceration and those producing similar lesions elsewhere. Trauma is probably the usual initiating factor; though toxaemia, localized vascular spasm, and even trophic neuritis may occasionally play a part in its onset. When an acute ulcer results from the action of one or more of these factors the natural reparative processes of the body attempt to produce healing, but their action is opposed both by the physiological peristaltic activity and by the digestive nature of the gastric secretion. Dragstedt (1942) has shown that these alone are not sufficient to delay physiological healing and to lead to chronic ulceration in a normal individual.

The stomach and duodenum are readily digested by pure gastric secretion, particularly if the latter has a high acid content, but they are rarely exposed to such action in a normal individual. The acid content of the stomach is relatively low unless provoked by the presence of food, which itself acts as a diluent, and it is still further lowered during digestion by the periodic regurgitation of duodenal contents. Moreover, all living tissues display a considerable resistance to digestion by the gastric juices owing to the protection afforded by their mucous surface secretions. It is only when these protective mechanisms are overcome that a typical peptic ulcer develops in experimental animals.

Past Attempts at Physiological Surgery

Hyperacidity has long been recognized as the main factor responsible for the abnormal persistence of the ulcerative process and the consequent development of a chronic ulcer. From the introduction of gastro-enterostomy by Wolfler in 1881, successive attempts have been made to deal surgically with this problem along physiological lines. None of them has proved entirely successful, however; even the various modifications of subtotal gastrectomy, which have so far formed the most certain approach, being not without certain drawbacks and a proportion of failures.

The rationale of these operations is the resection of a sufficient area of the acid-secreting portion of the stomach to prevent subsequent hyperacidity, and, since this will obviously vary from individual to individual, their success depends on striking a correct balance in each case. To leave too much stomach will obviously defeat the whole object of the procedure, whilst the removal of too much may lead to possible anaemia and the development of "small stomach" symptoms afterwards. The latter are, in fact, responsible for the majority of poor results following modern techniques, as the tendency is towards over-removal of gastric mucosa in an attempt to prevent subsequent ulcer recurrence. Recent figures show that a surprisingly high percentage of patients who have had apparently successful gastric resections are unfitted for full economic life afterwards by the intermittent gastro-intestinal upsets which follow and the impossibility of returning to normal dietetic existence.

Gastrectomy has other disadvantages also. The operative mortality, though surprisingly low in expert hands, is necessarily higher in the older age groups—the very patients in whom the complications of ulcer have themselves such a high death rate. Moreover, it is a mutilating operation and, while a physiological proceeding so far as the ulcer problem is concerned, leaves an unphysiological and deformed upper digestive tract in its wake.

The Ulcer Diathesis

The relative failure of all past surgical attempts to deal really successfully with peptic ulcer has recently resulted in careful reconsideration of the problem of the ulcer diathesis and its underlying factors.

It has long been recognized that a true ulcer diathesis does exist. The typical ulcer patient belongs to Goldthwait's (1915) asthenic type. He is a thin, lanky, narrow-chested individual with a "lean and hungry look"—driving, ambitious, emotional, and tense. The psychic make-up accompanying these physical characteristics often determines the choice of occupation, with the result that certain professions and trades—such as engineering, law, and surgery—are particularly ulcer-prone. There are, however, quite a number of ulcer patients who do not fall into this main group. These individuals belong more to the sthenic type. They may exhibit a most deceptive external calm and seem to keep their nervous stress hidden well beneath the surface. It is interesting, as Moore (1946) points out, that this type of individual tends to suffer from ulcers which bleed rather than from typical ulcer pain.

To whichever group the ulcer patient belongs, however, he shows the same reaction towards his environment. Most intelligent patients can correlate definite exacerbations of their symptoms with such events as prolonged nervous stress, fatigue, overwork, or irregular meal hours. Sex also seems to play a contributory part in ulcer development.

The relative incidence in males is rising steadily in response to the greater stress of modern life, which normally affects men more than women. In a series of 9,000 necropsies performed on chronic ulcer cases up to 1923, Stewart (1923) found chronic ulcer to be twice as frequent in males, and approximately the same sex-incidence ratio was present in 4,000 necropsies disclosing acute ulcer; whereas the admission rate to E.M.S. hospitals of ulcer cases for operation in the period 1942–3 shows a 10 : 1 male preponderance in the 15–35 age group and a 4.6 : 1 ratio in patients over that age.

It appears that the ulcer diathesis is rather the result of nervous stress on a particular psychosomatic type than a mere accident of physical build. This is further supported by the evidence of Simnitzky (1926, 1927) and Fokin (1925), who showed the presence of parasympathetic hyperactivity in a high percentage of peptic ulcer cases.

Results of Recent Research

A considerable amount of recent research has therefore been directed to the investigation of the mechanism through which this vagotonia modifies normal gastric secretion.

A. Influence of the Vascular Supply

Little work appears to have been done on the relationship between vascular supply and gastric secretion, but it is reasonable to suppose, as Le Veen (1948) points out, that it is similar to that of other glandular structures which have been more carefully investigated, such as the salivary glands and the kidney.

It has been shown in fully denervated experimental preparations of these organs that their secretion is directly proportional to the volume of blood flow; and it is known from work on the voluntary muscles and heart that muscle contraction is similarly dependent on its vascular supply. Since gastric secretion is undoubtedly increased by hyperperistalsis, vasodilatation of the stomach vessels may therefore influence it by both these mechanisms.

B. Chemical Factors

It was first shown by Komarov (1945) that when extracts of the pyloric antrum and the first part of the duodenum are injected into the blood gastric secretion results. This secretion, which is identical with the juice of the chemical phase of gastric digestion, differs from that of the nervous phase by its high acid content and relative deficiency in pepsin. It is unaffected by atropine, and must therefore result from a purely chemical stimulus to the gastric glands. The extract responsible for this response does not contain histamine, and its causal component appears to be a polypeptide known as "gastrin." There seems little doubt that this is in fact the normal mechanism by which the chemical phase of gastric secretion is produced, and that the latter is the result of the action of the absorbed products of the early nervous phase of digestion on the glands of the pyloric antrum.

Contributory evidence of the purely chemical action of this mechanism and of its lack of dependence on any neurogenic stimulus is provided by the results of antrectomy. This operation, in which the mucosa of the pyloric antrum and first part of the duodenum is resected without any other surgical procedure, results in profound modification of the secondary phase of the gastric secretion; whereas complete gastric neurectomy affects the latter only relatively slightly.

C. Influence of the Nerve Supply

The detailed work of Swann (1834), Kollmann (1860), McCrea (1924), and Mitchell (1940) on the anatomy of the vagus nerves has not yet found its way into the standard textbooks on anatomy. They form an intricate plexus on the thoracic oesophagus from lung roots to diaphragm, and re-form into their main abdominal trunks only at the latter level. They constitute the parasympathetic supply of the stomach, small intestine, and caecum, and give branches to the liver, spleen, and pancreas. As in the case of the sympathetic, they act on the bowel by modifying the tone of the two intestinal plexuses, which are primarily responsible for both movements and secretion.

The actual mechanism by which these plexuses operate is still imperfectly understood, but the work of Tyrrell-Gray (1936) provides the most plausible explanation. He suggests that the primary movement of the bowel is a small recurrent rhythmical wave of contraction initiated by the ganglionated cells of the plexuses. The presence of a food bolus simultaneously stimulates Auerbach's plexus, producing a deep peristaltic contraction behind it, and also Meissner's plexus, resulting in a preceding wave of relaxation. Recent work on the "peristaltic gradient" of the intestine supports this hypothesis.

Modern research has added considerably to the knowledge of the function of the gastric nerve supplies. It was first suggested by Carlson (1913) and confirmed by McCrea that gastric peristalsis is governed entirely by the vagus, acting through the local plexuses, and that the muscle "tonus," upon which the peristaltic movements are superimposed, is separately controlled by the sympathetic. McSwiney (1931) has shown that the sympathetic nerves carry both stimulator and inhibitor fibres, and McCrea's work indicates that the former are concerned with the maintenance of gastric tone and the latter with peristalsis. The sympathetic is therefore not a true antagonist of the vagus, as is so often taught. The sympathetic supply to the stomach, as elsewhere in the body, controls the vascular tone, and it also forms the pathway for sensory impulses. Moore *et al.* (1946) have shown that painful stimuli can be produced by the inflation of an intragastric balloon after complete abdominal vagotomy. Latarjet's work proved that the pain of gastric crises, unaffected by vagotomy, ceases after complete gastric sympathectomy (Latarjet 1922; Latarjet and Wertheimer, 1923). Grimson *et al.* (1947) have demonstrated that the vagus does not carry sensory tracts, and Dragstedt (1947) has shown that recurrence of ulcer pain can be reproduced after complete vagotomy by the ingestion of sufficient quantities of strong hydrochloric acid. This work is in keeping with that of Bentley and Smithwick (1940), who showed that many of the afferent pathways from the duodenum, gall-bladder, and biliary tract are via the sympathetic supply of these organs.

It therefore seems probable that the sympathetic supply of the stomach and duodenum plays little part in the aetiology of peptic ulcer, apart from any secondary action such as that which may be produced by the local anaemia resulting from an abnormally high sympathetic tone. The vagal supply, on the other hand, is known to be directly concerned with gastric secretion, in addition to any indirect effect on this which it may produce through its action on peristalsis. The psychic secretion which precedes the ingestion of food is due to vagal stimulation of the gastric glands. The same reflex occurs within 10 to 15 minutes of "sham feeding," apart from any psychological stimulation, and is probably the result of a vagal reflex from deglutition and mastication. The gastric secretion which results from this psychic or neurogenic stimulation is rich in both pepsin and hydrochloric acid, and persists for some time independently of the succeeding chemical phase.

Cushing (1932) showed the existence of a nerve pathway between the cerebral cortex and the upper gastro-intestinal region. From combined clinical and pathological evidence he showed that a definite nerve tract connected the vagal

centres with the cortex, and that irritative lesions along this tract resulted in ulceration of the stomach and duodenum. He demonstrated, further, that this was due to hyperactivity of the vagal centres and that the same result was produced by the action of psychic stimuli on the area of cerebral cortex at which this tract began. His important work, the full implications of which have only recently been realized, confirmed the investigations of previous workers on experimental dogs. Stahnke (1924) had already produced typical peptic ulcers in these animals as the result of the increased neurogenic gastric secretion following vagal stimulation. Hartzell (1929) had shown that complete vagal section resulted in permanent reduction of the gastric acidity, though this effect was only transient if section was incomplete; and Beaver and Mann (1931) had completed this chain of evidence by demonstrating that the only dogs to escape peptic ulceration after a Mann–Williamson (1923) physiological gastro-enterostomy were those in which complete vagotomy had also been performed.

The neurogenic secretion of gastric juice is not entirely limited to psychic stimulation, although Pavlov's (1910) original views to this effect are still regrettably present in many textbooks. Carlson (1923) showed, after intensive animal and clinical experiment, that there is normally a small continuous secretion of gastric juice even in prolonged fasting, and that this secretion is of the same type as that of the psychic phase of normal digestion though less in degree. Dragstedt and Schafer (1945) showed that this secretion was present to an excessive extent in the typical ulcer patient even during sleep, and that it was accentuated in emotional states and nervous stress. Wolf and Wolff (1942), studying a man with a permanent gastric fistula and complete traumatic oesophageal occlusion, have shown that the excessive acid secretion resulting from emotional conflict produces typical ulcer symptoms associated with definite changes in the gastric mucosa. When such physiological stimuli were prolonged the consequent hyperchlorhydria resulted in intense mucosal hyperaemia, with the development of small petechial haemorrhages, and the affected mucosa showed an increased tendency to macroscopic erosions through quite trivial trauma. If these erosions were then exposed to free hydrochloric acid small acute peptic ulcers rapidly developed.

The Development of Vagotomy

An analysis of all this evidence suggested that the most rational physiological approach to the problem was to be found in vagotomy, and a number of attempts had been made along these lines before Dragstedt and Owens's first reported successes. Most of these had been made through an abdominal approach and were reviewed by Hartzell (1929). The first transthoracic approach was made by Pieri and Tanferna (1930), but their cases were not uniformly successful, and it was left to Dragstedt and Owens (1943) to elaborate a suitable technique. A year later Dragstedt (personal communication) was also the first to evolve the modern abdominal approach, which he afterwards described in detail. Since then a voluminous literature from many sources has grown up on the technique and after-results of vagotomy, and a great deal of detailed research has been made into the physiological end-results of this operation. Nearly 1,500 successful cases have now been reported from the U.S.A., Scandinavia, and Britain alone, so that the operation can no longer be considered an experimental method of treatment.

The majority of surgeons employing vagotomy confine its use to the treatment of uncomplicated duodenal ulcer in the younger age groups, and of recurrent ulceration following more radical procedures. But there is a strong case for carrying it out as a routine, as a concurrent procedure, whenever gastrectomy or gastro-enterostomy is performed for peptic ulceration; and I believe that it may also have a place as the sole treatment of some types of gastric ulcer. There is a justifiable tendency to avoid vagotomy in gastric ulcer through fear of later malignant change or of missing early carcinomata. But this does not apply in the same degree to small subacute lesions of the lesser curvature which fail to respond rapidly to energetic medical treatment, or to the high cardiac ulcers which are otherwise so difficult to deal with surgically. My own series of more than 160 vagotomies includes a number of successful operations in this type of case.

Apart from the effects on the stomach and duodenum, which are described below, division of the vagus nerves appears to produce few physiological sequelae in the other abdominal viscera. It has been shown by several investigators, including Ivy (1934), that vagotomy is followed by a slightly decreased secretion of bile and pancreatic juice; Pfeiffer *et al.* (1940) have described a temporary postoperative drop in blood calcium similar to that found to occur in experimental dogs; and the occasional occurrence of the "dumping syndrome" after operation suggests that there may also be some temporary alteration in the amount of insulin secreted. But all these are minor effects, and the absence of any more definite sequelae is in accordance with the clinical results following high subtotal gastrectomy and lower oesophagectomy, in which a concurrent complete abdominal vagotomy is almost always unwittingly carried out.

Clinical Results of Vagotomy

The most dramatic effect of vagotomy is the immediate relief of all pain and other ulcer symptoms, together with a rapid increase in weight. The psychological reaction of the patients after operation is highly satisfactory, and the majority of them are enabled to return to full economic life within six weeks.

There has been no proved case of ulcer recurrence following a complete neurectomy, as checked by insulin test meal. This test, first described by Hollander (1944), depends on the fact that the hunger pains consequent on hypoglycaemia are associated with excessive gastric secretion. This was originally demonstrated by Roholm (1930); and Okada *et al.* (1929) and La Barre and de Cespédès (1931) showed that the hypersecretion is dependent on the integrity of the vagal pathway. The acid response of the stomach is very great where this pathway is normal, but it is abolished after complete vagotomy. As might be expected, another effect of vagotomy is to lower both the total volume and the acidity of the gastric secretion. Thornton *et al.* (1946) and Grimson *et al.* (1946) have both drawn attention to these changes in the night fasting juice, which are similar to those previously described by Hartzell in the fractional test meal. I have shown that the free hydrochloric acid secreted during a fractional meal test is reduced to one-third of the pre-operative quantity, but that the general character of the curve remains otherwise unaltered (Beattie, 1948). This drop in acidity is undoubtedly the main factor responsible for the disappearance of the previous ulcer diathesis after vagotomy.

As the result of the immediate paralysis of the stomach and small intestine, which only gradually recover their tone and power of movement, certain unpleasant retention symptoms occur. Almost complete gastric paralysis persists for two to three days and peristalsis then gradually returns, though it probably never reaches the same frequency and amplitude as previously. Moore *et al.* (1946) and Grimson *et al.* (1947) have investigated this subject

by means of repeated radiological examinations and pressure-recording intra-intestinal balloons. The latter workers have shown that there also is a gradual increase in muscle tone, which may reach two or three times its pre-operative strength within three years. Despite this, however, some degree of gastric dilatation often occurs—the probable result of pylorospasm from the unopposed action of the sympathetic nerve supply at the pylorus. This has been checked radiologically by Moore *et al.* (1946) and by Lawson (personal communication), and it has been shown by Grimson *et al.* (1947) that similar minor alterations in muscle tone and movement also occur in the duodenum and jejunum.

In addition to the immediate gastric paralysis there is nearly always some degree of temporary dysphagia following operation. This is the result of cardiospasm secondary to the trauma inflicted on the lower oesophagus and to interference with its nerve supply. It always passes off spontaneously within a few weeks, but while it exists it increases the tendency to gastric distension already present by the aerophagy which it encourages.

These retention phenomena, which present themselves clinically as occasional attacks of flatulence associated with eructation of foul gas towards evening or in the early hours of the morning, may be accompanied by mild regurgitant vomiting and followed by transient diarrhoea. In the majority of cases they are relatively mild and are regarded by the patient as of only minor importance, but they may be more severe and last for many months. They tend to subside eventually as the stomach recovers its tone and peristalsis, but may be so persistent that further operation becomes necessary. Dragstedt (personal communication) has pointed out that even in the milder cases there is a tendency for similar attacks of the same character to occur throughout the subsequent lifetime of these individuals. Such attacks occur during the same emotional crisis and nervous stress as would previously have produced ulcer exacerbations, and are probably due to the unopposed action of the sympathetic system in the new gastro-intestinal response to the nervous impulses consequent on psychic stimuli.

Recent work on certain choline derivatives has produced drugs which have a relatively selective action on the gastro-intestinal part of the parasympathetic system, and I have found the administration of these to be of value in reducing the severity of the retention symptoms in some cases. Unfortunately they do not yet appear to be equally effective in all instances, though it seems probable that further research in this direction may eventually prove more successful.

Conclusion

There seems little doubt that the final solution to the ulcer problem lies along medical lines. It should not be beyond the limits of future possibility for suitable drugs to be developed to control the vagotonia which is the underlying cause of the ulcer diathesis.

Till then, however, the failure of medical treatment in a certain proportion of cases will continue to result in chronic ulceration, which can be dealt with successfully only by surgical means. There is little doubt that vagotomy will ultimately come to be accepted as the routine surgical treatment for chronic duodenal ulcer and for the complications of anastomotic and jejunal ulcer after gastrectomy or gastro-enterostomy. It may even find a place in the treatment of some varieties of chronic gastric ulcer. It has a much lower operative mortality and post-operative recurrence rate than the more radical procedure of gastrectomy, and gives a higher proportion of full economic successes. But it is still relatively in its infancy, despite the six-year post-operative records of the earlier cases that are now available; and it requires further technical development to eliminate its occasionally severe retention sequelae before it can be regarded with complete confidence.

BIBLIOGRAPHY

Beattie, A. D. (1948). *Ann. R. Coll. Surg. Engl.*, **2**, 248.
Beaver, M. G., and Mann, F. C. (1931). *Ann. Surg.*, **94**, 1116.
Bentley, F. H., and Smithwick, R. H. (1940). *Lancet*, **2**, 389.
Carlson, A. J. (1913). *Amer. J. Physiol.*, **32**, 369.
—— (1923). *Physiol. Rev.*, **3**, 1.
Cushing, H. (1932). *Surg. Gynec. Obstet.*, **55**, 1.
Dragstedt, L. R. (1942). *Arch. Surg.*, **44**, 438.
—— (1947). *Canad. med. Ass. J.*, **56**, 133.
—— and Owens, F. M. (1943). *Proc. Soc. exp. Biol., N.Y.*, **53**, 152.
—— and Schafer, P. W. (1945). *Surgery*, **17**, 742.
Fokin, V. V. (1925). *Russk. Klin., Mosk.*, **3**, 891.
Goldthwait, J. E. (1915). *Boston med. surg. J.*, **172**, 881.
Grimson, K. S., *et al.* (1946). *Sth. med. J.*, **39**, 460.
—— *et al.* (1947). *J. Amer. med. Ass.*, **134**, 925.
Hartzell, J. B. (1929). *Amer. J. Physiol.*, **91**, 161.
Hollander, F. (1944). *Gastroenterology*, **3**, 463.
Ivy, A. C. (1934). *Physiol. Rev.*, **14**, 1.
Kollmann, J. (1860). *Z. wiss. Zool.*, **10**, 413.
Komarov (1945). Quoted by S. Wright, *Applied Physiology*, 8th ed. Oxf. Univ. Press, London.
La Barre, J., and de Cespédès, C. (1931). *C. R. Soc. Biol., Paris*, **106**, 480, 1249.
Latarjet, A. (1922). *Bull. Acad. Méd., Paris*, **87**, 681.
—— and Wertheimer, P. (1923). *Pr. méd.*, **31**, 993.
Le Veen, H. H. (1948). *Surg. Gynec. Obstet.*, **86**, 164.
McCrea, E. D'A. (1924). *J. Anat., Lond.*, **59**, 18.
McSwiney, B. A. (1931). *Physiol. Rev.*, **11**, 478.
Mann, F. C., and Williamson, C. S. (1923). *Ann. Surg.*, **77**, 409.
Mitchell, G. A. G. (1940). *J. Anat., Lond.*, **75**, 50.
Moore, F. D. (1946). *Bull. New Engl. med. Center*, **8**, 193.
—— *et al.* (1946). *New Engl. J. Med.*, **234**, 241.
Okada, S., *et al.* (1929). *Arch. intern. Med.*, **43**, 446.
Pavlov, I. P. (1910). *The Work of the Digestive Glands.* Griffen, London.
Pfeiffer, C., *et al.* (1940). *Amer. J. Physiol.*, **129**, 756.
Pieri, G., and Tanferna, U. (1930). *Rif. med.*, **46**, 323.
Roholm, K. (1930). *Acta med. scand.*, **73**, 472.
Simnitzky, S. (1926). *Klin. Wschr.*, **5**, 1545.
—— (1927). Ibid., **6**, 991.
Stahnke, E. (1924). *Arch. klin. Chir.*, **132**, 1.
Stewart, M. J. (1923). *British Medical Journal*, **2**, 955, 1021.
Swann, J. (1834). *Demonstration of the Nerves of the Human Body.* Longmans, London.
Thornton, T. F., *et al.* (1946). *J. Amer. med. Ass.*, **130**, 764.
Tyrrell-Gray, H. (1936). In Maingot's *Postgraduate Surgery*, vol. 1, p. 1185. Med. Pub., London.
Wolf, S., and Wolff, H. G. (1942). *J. Amer. med. Ass.*, **120**, 670.

NOTES ON EXPERIMENTS ILLUSTRATING NORMAL TEMPERATURE REGULATION IN YOUNG MEN

BY

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It has been the custom for some years in the department of physiology for our students to carry out a series of experiments which illustrate some of the more important facts about body temperature and its regulation in man. The experiments are conveniently performed during the vacation in the student's own home, as they require no special apparatus but do need a good deal of time and access to a bathroom. In this paper brief particulars are given of these experiments for the benefit of teachers who might care to use them. Some illustrative results are also shown graphically; most readers may find these graphs more instructive than a statistical analysis of the results. All the observations on which this report is based were carried out on healthy young men during the summer vacation; the readings are given in °F. I am greatly indebted to the students whose results I have used.

Temperature in the Mouth, Groin, and Axilla

The subject, using a so-called "half-minute" thermometer, is instructed to read the temperature at half-minute

intervals at these sites until a steady maximum reading is obtained; this maximum is an approximate measurement of blood temperature. Two illustrative sets of curves are given in Fig. 1. They show that in the mouth the steady maximum is attained after some three or four minutes, while in the groin and axilla a longer time is necessary—up to five or even seven minutes. The curves also show the well-known fact that generally the maximal temperature in the axilla is lower by 1° F. (0.55° C.) or more than that in the mouth; the maximal temperature in the groin approximates more closely to that in the mouth.

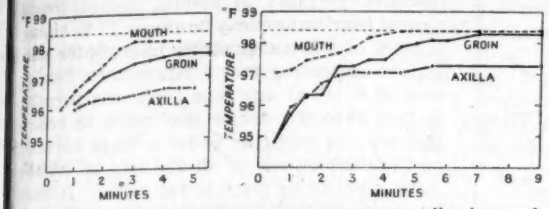

FIG. 1.—Time taken to get a constant temperature reading in mouth, groin, and axilla.

It is perhaps unfortunate that the clinical thermometers in common use have inscribed on them "half-minute" or "two minutes." The person using the thermometer is thus misled into believing that when it is kept in the mouth or elsewhere for the specified time it records accurately the *body* (i.e., the *blood*) temperature. The figures on the thermometer do accurately indicate its physical properties under specified test conditions outside the body; thus the figures give the time that it takes the thermometer to record accurately the temperature in a thermostatically controlled bath of water. But when the thermometer is used clinically under very different physical conditions we must allow enough time to elapse to permit the thermometer in the mouth, groin, or axilla to attain temperature equilibrium with the blood; the curves in Fig. 1 show that the thermometer must be kept in position for three minutes or longer to achieve this end.

I venture to suggest that clinical thermometers should be relabelled as "rapid" and "slow" to indicate their relative physical sensitivity, and that the thermometer should be inscribed with an instruction that it should be kept in the mouth for not less than three minutes or until a constant temperature reading is obtained. I fully appreciate that if such instructions were faithfully followed it would take one nurse equipped with one clinical thermometer nearly one hour to record the temperature of ten patients; but this difficulty could be overcome by using several clinical thermometers simultaneously or, as suggested by a correspondent in the *Lancet*, by recording the temperature only of those patients in whom temperature disorders are known to be present or are suspected. It is obviously undesirable for the nursing staff to spend a good deal of time carelessly taking many inaccurate readings. The same remarks apply to temperature-recording in a busy surgery or during the rush of home visits.

Effect of (i) Hot and (ii) Cold drinks on Mouth Temperature

(i) The subject is told to drink one cup of hot tea, and in a second experiment two cups, at a temperature of 140–150° F. (60–65.5° C.). (ii) The subject is told to drink 1 litre of ice-cold water. In each case the mouth temperature is read at half-minute intervals until it returns to the control level; in these experiments the "half-minute" thermometer used is initially recording changes in the temperature of the mucous membrane of the *mouth* and not changes in blood temperature.

(i) Fig. 2*a* shows that after one cup of hot tea the mouth temperature may rise rapidly to 101.4° F. (38.55° C.), and after two cups to 102.6° F. (39.2° C.). It then falls to control level in five minutes after one cup and in about eight minutes after two cups of hot tea. A hot drink may thus sometimes be the cause of an unexplained clinical "pyrexia."

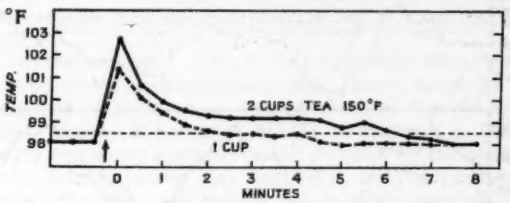

FIG. 2*a*.—Effect of a hot drink on mouth temperature.

(ii) Fig. 2*b* shows the effects of drinking the cold water as quickly as possible, and Fig. 2*c* of drinking it over a period of 12 minutes. The mouth temperature may fall from 97.8 to 95° F. (36.55 to 35° C.) or less; it remains round about this low level for 8 to 20 minutes and slowly recovers as the oral mucosa is warmed up again by the circulating blood.

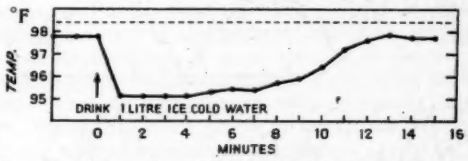

FIG. 2*b*.—Effect of a cold drink on mouth temperature.

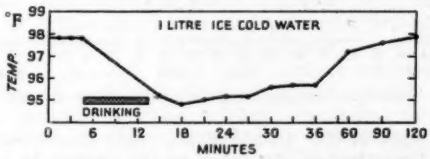

FIG. 2*c*.—Effect of a cold drink on mouth temperature.

Diurnal Variation

The subject is asked to record his mouth temperature every hour throughout the day and night for 72 hours, taking the precautions called for from the preceding observations. In quite a number of cases the instructions were followed literally. The only way to get regular night readings is to have at the bedside an alarm clock suitably set to wake the subject up each successive hour. The value of the temperature readings is considerably enhanced if a careful note is made at the time of what the subject is doing, with special reference to work, food, sleep, room temperature, heart rate, and respiration. Illustrative records are set out in Figs. 3*a*, 3*b*, and 3*c*.

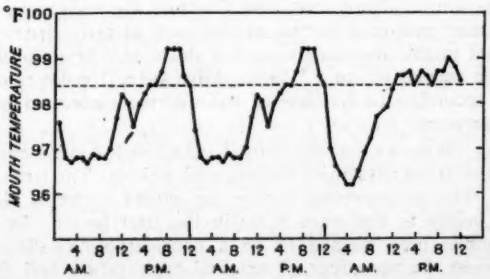

FIG. 3*a*.—Diurnal variation of body temperature.

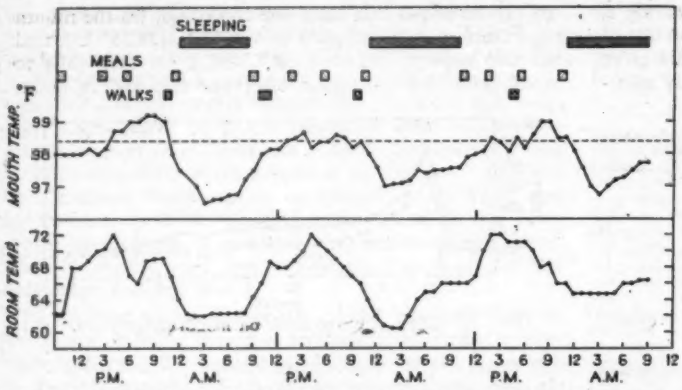

FIG. 3*b*.—Diurnal variation of body temperature in relation to external temperature and bodily activities.

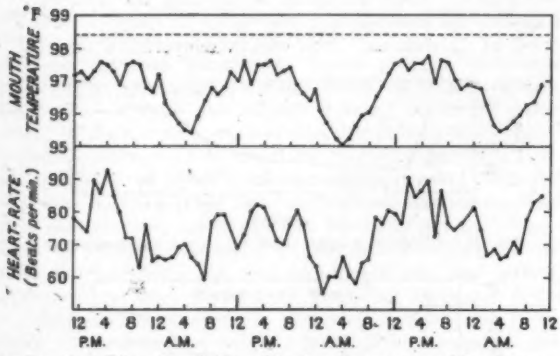

FIG. 3*c*.—Diurnal variation of body temperature and heart rate.

Such experiments are of great value in teaching the student the extent of the range of the normal, in himself and his friends, of several so-called "physiological constants." The student also learns to appreciate the fundamental difference between an average value and a normal range, a distinction which is of the utmost importance in many branches of physiology and medicine. The examples of diurnal variation here illustrated show in Fig. 3*a* a range between 99.2 and 96.2° F. (37.3 and 35.7° C.), in Fig. 3*b* between 99.2 and 96.5° F. (37.3 and 35.85° C.), and Fig. 3*c* between nearly 98 and 95° F. (36.7 and 35° C.). A daily fluctuation of 3° F. (1.66° C.) may thus occur in any one normal person. The possible extent of the "tolerated" daily fluctuation is not fully appreciated, because it is very unusual to take records steadily during the night, and it is commonly at the inconvenient hours of 2 to 6 a.m. that the minimum temperatures are generally observed.

Fig. 3*c* shows a beautiful correlation between mouth temperature and heart rate, incidentally confirming the well-known clinical dictum that the heart rate varies by 10 beats per minute for every 1° F. change in body temperature. The curves also illustrate the wide range of the heart rate in a normal person even at rest; the range at rest in this instance is from a so-called "bradycardia" (pulse rate of 60) to a "slight tachycardia" (pulse rate of 90), according to the time of day and the associated body temperature.

Fig. 3*b* shows that the diurnal variation is fundamentally related to the rhythm of sleeping and waking. The temperature falls progressively during the earlier hours of sleep, but begins to rise once more in the later hours. In this example there seemed to be a considerable relationship between the variations of external temperature and those of body temperature.

The question may be fairly asked: Why have a mark on clinical thermometers opposite 98.4° F. (36.9° C.)? In one person such a temperature at any time of the day may represent pyrexia; in another the maximum normal temperature may be almost 1° F. higher. A mark of this sort probably misleads the public into supposing that a temperature reading over 98.4° F. at any time represents pyrexia; in time even the doctor may begin to believe that too. It might be better to have no mark on the thermometer at all and rely on suitable instructions being given to the public. It might be explained that a temperature over 99.5° F. (37.5° C.), taken with the precautions previously explained, probably represents pyrexia; but it should also be made clear that ideally one should be familiar with a person's temperature range in health, because in people with a lower temperature range an apparently "normal" temperature reading may represent pyrexia.

Effect of a Hot Bath on Temperature, Respiration, and Heart Rate

The subject gets into a hot bath and stays in it for about five or six minutes; observations are made while in the bath and after getting out of the bath until the control

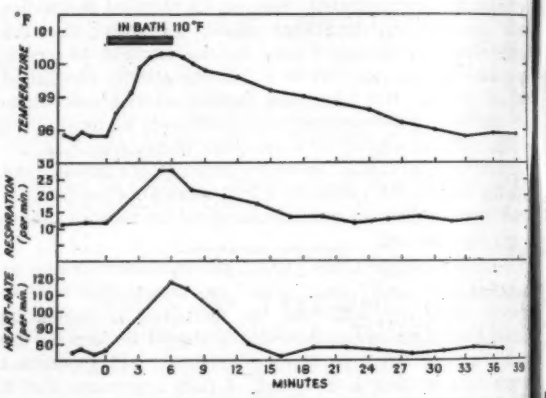

FIG. 4.—Effect of a hot bath on body temperature, respiration, and heart rate.

levels are reached. Fig. 4 shows that in a bath at 110° F. (43.3° C.) the mouth temperature may rise from about 97.8° F. (36.55° C.) to over 100.3° F. (37.95° C.); the heart rate may increase from 75 to 115 and the respiration rate from 12 to 28 per minute. Mouth temperature may subsequently take some 30 minutes to return to normal, though respiration and heart rate recover rather more rapidly.

This experiment shows clearly the limitations of normal temperature regulation, and how it can break down quickly under conditions of stress. In a bath at 110° F. (43.3° C.) heat is being taken up by the immersed part of the body, and heat loss depends mainly on evaporation of sweat from the exposed part of the body. As the atmosphere in the bathroom is very humid, evaporation of sweat is probably minimal. Body temperature is therefore raised by the heat released by the metabolism as well as by the heat taken up from the surrounding medium. This experiment is of clinical interest in showing that the body and mouth temperature may be raised for a considerable time after a hot bath.

Effect of Exercise

The subject is asked to take a sharp walk for about 15 minutes. Fig. 5 shows that the temperature may rise as a result by over 1° F., recovering slightly in the next half-hour. The exercise was only moderately severe as judged by the rise in pulse rate from 60 to 125. Severe exercise in a hot, humid climate may produce pronounced pyrexia.

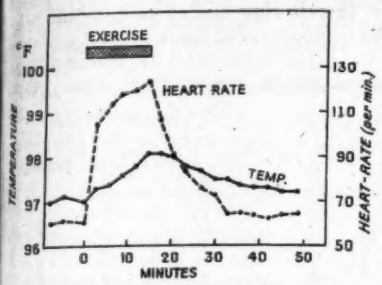

FIG. 5.—Effect of exercise on body temperature and heart rate.

Effect of (i) Standing Naked in Front of a Window for 20 Minutes and (ii) a Cold Bath

(i) These experiments were all conducted in the summer, when the external temperature was of the order of 60° F. (15.5° C.). Fig. 6*a* shows a number of results. Usually the fall of body temperature during the 20 mins. is quite small owing to compensatory mechanisms coming into action—e.g., from 98.4 to 98.2° F. (36.9 to 36.8° C.) or from 98 to 97.2° F. (36.7 to 36.2° C.) — sometimes compensation is less complete and the temperature falls to a greater extent—e.g., from 98 to 96.5° F. (36.7 to 35.85° C.). Fig. 6*a* also shows that sometimes, during the period of exposure to cold, body temperature may rise by nearly 1° F., presumably because of an overswing of the compensatory mechanisms.

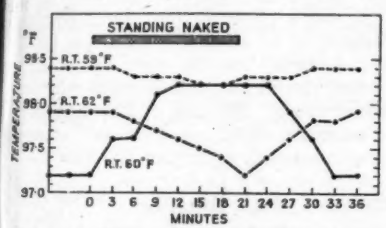

FIG. 6*a*.—Effect on body temperature of standing naked in front of an open window for 20 minutes.

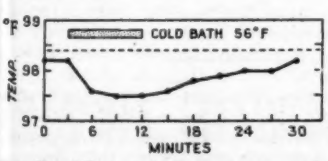

FIG. 6*b*.—Effect on body temperature of a cold bath at 56° F. (13.3° C.).

Fig. 6*b* shows the modest temperature-lowering effect of a cold bath at 56° F. (13.3° C.).

Summary

Simple experiments are described which illustrate the more important facts about normal temperature and its regulation in man.

Attention is drawn to the undesirability of having a mark on clinical thermometers opposite the 98.4° F. (36.9° C.) level, and of inscribing clinical thermometers with the words "half-minute" or "two minutes."

The Nursery School Association has started a new quarterly magazine called *Young Children* with the purpose of fostering a fuller understanding of children. The first number includes some of the evidence given by the late Dr. Susan Isaacs before the Curtis Committee. The price of the magazine is 1s. 6d.; it is obtainable from the Association at 1, Park Crescent, Portland Place, London, W.1.

USE OF DIPARCOL IN PARKINSONISM

BY

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A synthetic drug, "diparcol" (diethylaminoethyl-N-thiodiphenylamine hydrochloride), was found useful in the treatment of all forms of Parkinsonism by Sigwald *et al.* (1947) and by Bovet *et al.* (1947) in France. A limited supply was made available at this hospital by the courtesy of the manufacturers, May and Baker, Ltd., and a clinical trial of the drug was carried out in eight cases of post-encephalitic chronic Parkinsonism of varying degrees of severity. A ninth case, of malignant hypertension with the Parkinsonian syndrome, was given the drug for a short time before death; its effect, if any, could not be assessed, and the case was excluded from the series.

It is notoriously difficult to provide satisfactory criteria of change in the state of patients suffering from chronic disorders of locomotion. Evaluation of treatment therefore depends to a large extent upon the subjective opinions of the physician and of the patients and those around him, but it is advantageous to base opinions so far as is possible upon objective measurements. Carmichael and Green (1928) devised an apparatus to measure rigidity in resting limbs, and used the ergograph to record the performance of simple repetitive motions rather than of individual movements; but in the present study an attempt was made to consider each patient in terms of the following ten modal activities, which together involve automatic, impulsive, and deliberate movements of different degrees of complexity: (1) turning in bed, rising from and returning to bed; (2) dressing and undressing; (3) performance of the toilet, especially shaving in men; (4) eating; (5) walking; (6) turning around corners; (7) climbing stairs; (8) speaking; (9) writing; and (10) movements of facial expression as reflecting mood and interest.

The procedure was to observe each patient over a period of two to three months while they were receiving adequate dosage of the customary drugs (stramonium, hyoscine, belladonna) in such combination as produced the maximum benefit. In each patient the state of the ten modal activities varied, but an attempt was made to assess the efficiency of each according to the following scale:

0 = No activity on account of contractures or rigidity
1 = Activity grossly restricted or completely ineffective
2 = Moderate restriction, especially by rigidity
3 = Moderate restriction, especially by tremor
4 = Activity approaching normal, but slow and clumsy
5 = Activity practically normal, or at least effective

Throughout the test any lasting changes in the tremor or hypersalivation were recorded, but it was felt that little was to be gained from the observance of minute changes, especially in tremor, which so noticeably varies from hour to hour with the attitude and mood of the patient. In view of the failure of several authorities (Neal *et al.*, 1942) to find regular amelioration of oculogyric crises by treatment otherwise effective, a particular note was taken of the incidence of these and of "emotional" and "laryngeal" crises.

Diparcol was then given according to the scheme first recommended by the manufacturers, dosage being gradually built up over a period of five to six weeks, with simultaneous gradual withdrawal of the solanaceous drugs. Except in Case 1, the drug was given in the full dosage of 1 g. daily for a period of ten weeks, after which the effect of slightly varying the dose was studied. When the

most beneficial dosage was found, each case was reassessed in terms of the ten modal activities, and improvement or deterioration recorded. Slight improvement meant an increment of 1 unit, considerable improvement 2 units; conversely, slight deterioration was measured by a down-scaling of 1 unit, and so on. The results are shown in the table.

Modal Activity	Case 1		Case 2		Case 3		Case 4		Case 5		Case 6		Case 7		Case 8		Net Change
	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	
Turning in bed	0	1	4	5	4	5	4	5	4	5	1	2	5	5	3	5	8+
Dressing and undressing	0	0	4	4	4	5	3	4	3	4	0	0	4	5	3	4	5+
Toilet	0	0	3	4	4	5	3	4	3	4	0	1	4	5	3	4	7+
Eating	0	0	4	5	4	5	3	4	3	4	0	2	4	5	3	4	8+
Walking	0	0	3	4	5	5	3	4	3	5	0	1	4	5	3	4	7+
Turning corners	0	0	3	4	4	5	2	2	3	4	0	0	4	5	3	3	4+
Climbing stairs	0	0	3	4	4	5	3	3	4	4	0	0	4	5	3	3	3+
Speaking	1	2	3	4	3	4	3	3	3	4	1	2	3	4	3	4	7+
Writing	0	0	3	3	2	2	2	2	2	2	0	0	4	4	2	3	1+
Facial expression and mood	0	0	3	4	4	5	2	3	2	3	0	2	3	4	3	4	8+
Total change in each patient	2+		8+		8+		6+		9+		8+		8+		9+		58+
Notes and clinical impressions	Died during treatment		Striking benefit		Considerable benefit		Fainting turns		Fairly severe case gaining benefit		Subjective improvement marked. Bedridden		Moderate benefit		Salivation aggravated		

A = During control period with solanaceous drugs. B = During period of administration of diparcol. 0 = No activity. 5 = Practically normal activity.

In order to reduce the suggestive influence of a new and promising treatment three patients (Cases 2, 3, and 8) were gradually returned to the former regime of the solanaceous drugs, whereupon a notable relapse occurred, while reintroduction of diparcol once more brought favourable results. The substitution of inert tablets, mixtures, or injections to provide a control in the treatment is rarely of value, inasmuch as patients with even a mild degree of Parkinsonism soon become aware of the deception.

Results of Treatment

As will be seen from the table, all the patients derived a little benefit from diparcol as compared with previous treatment. Except in Case 1, in which death occurred suddenly, the numerical benefit in each case was about equal; this contrasts with the erroneous clinical impression that had been gained that the less severely affected patients were the most improved. The reason for this impression was the striking facilitation of normal or almost normal activities in those in whom such activities had been only slightly or moderately restricted. The importance of thus evaluating and tabulating the results is manifest.

In general it would seem that the more skilled activities, such as writing, walking round corners, and climbing stairs, were improved to a smaller degree than more "primitive" acts like turning in bed or eating, but such generalizations are hardly justified in such a small series.

Improvement in the feeling of well-being was quite noteworthy in several patients; this was to some extent included in the tenth modal activity (expression).

In respect of ambulant patients any improvement, however small, in the performance of simple domestic or social tasks represents a considerable boon. The loosening up of a rigid bedridden patient, while less spectacular, was reflected in a decrease in nursing requirements.

Oculogyric crises were not significantly influenced by the drug, but in one patient there seemed to be relative freedom from "laryngeal crises" during the administration of full doses.

Undesirable Effects.—(1) Hypersalivation was not well controlled by diparcol in four of the cases, in which the addition of small doses of belladonna became necessary. (2) Faintness and "fainting turns" occurred in two patients, but were absent when the dosage was slightly reduced. (3) Paraesthesiae consisting of creeping or burning sensations referred to the head and upper trunk were mentioned by two patients. This feature tended to pass off after reassurance, despite continuance of the drug. (4) Transient blurring of vision was noted in one case. (5) Undue drowsiness was complained of by one patient; three others reported that they were sleeping better. (6) Weekly blood counts were carried out in half the cases in view of the death of one of Sigwald's patients from agranulocytosis (which was not thought to be related to treatment by the drug). There was a tendency for the white cell count to fall to 4,000 per c.mm. during the initial weeks, with subsequent rise to former levels. No case of true leucopenia occurred. In one patient a slight iron-deficiency anaemia was noted; this responded well to ferrous sulphate.

Illustrative Case Histories

Case 1.—A debilitated woman aged 30 was suffering from progressive Parkinsonism which followed an attack of encephalitis lethargica at the age of 7. She was almost completely bedridden on account of rigidity of the limbs and trunk, the upper limbs were maintained in flexion, with the lower limbs partially extended. Hypersalivation and seborrhoea were excessive, and she was subject to frequent oculogyric and laryngeal crises; speech was infrequent and practically unintelligible. After receiving diparcol for a month, with little benefit, she developed pyrexia associated with respiratory symptoms and was taken off that drug, full doses of stramonium and hyoscine being substituted. Five days later she died suddenly. Necropsy revealed only bronchopneumonia, but it was noted that rigor mortis of the viscera had persisted longer than usual. According to Hall (1943), sudden unexpected death is not rare in young women with Parkinsonism. Perhaps the sudden withdrawal of the diparcol resulted in a paroxysmal autonomic crisis leading to fatal peripheral circulatory failure and bronchopneumonia. Similar crises have been reported by Ostow (1943) and Oller (1946).

Case 2.—A labourer aged 36 first developed oculogyric crises at the age of 29, after which the full Parkinsonian picture slowly became manifest. He was ambulant, but experienced particular restriction of fine movements, largely from rigidity. His general health was good. Following treatment with diparcol he obtained uniform benefit in almost all locomotor functions, gratefully attested by his relatives. During the administration of large doses he complained of occasional paraesthesiae and faintness. Only laziness prevented him from undertaking simple remunerative employment.

Case 8.—A retired lamp-lighter aged 64 had suffered from encephalitis lethargica in 1919 at the age of 35. Considerable disability of gait had been present for at least three years, together with gross tremor and rigidity of the limbs, which considerably restricted all motor activities. Rigidity of the trunk, which prevented his turning in bed at night, was a constant source of annoyance to him before receiving diparcol.

Fairly uniform amelioration of his rigidity brought much satisfaction, although tremor was not noticeably abated and an excess of mouth-dribbling demanded the addition of belladonna. This patient, whose general physical state was below normal, developed an anaemia which responded to iron. He complained also of transient blurring of vision while receiving diparcol.

Conclusions

Diparcol seems to offer some advantages over the tropane series of alkaloids (exemplified by stramonium) in the treatment of Parkinsonism of all grades.

It is advisable to start with small doses, and gradually to increase dosage up to a maximum of 1 g. daily until significant benefit is obtained. Withdrawal of the solanaceous drugs should be correspondingly slow; indeed, it is probably wise not to deprive patients of belladonna or stramonium completely.

It was found that treatment with two 0.25-g. tablets upon wakening, followed by one tablet at noon and one at about 5 p.m., brought the greatest reduction of rigidity, there commonly being a spontaneous improvement (apart from treatment) in the evening.

Summary

The advantageous and untoward results of the drug diparcol in the treatment of eight cases of Parkinsonism are reported, and the use of the drug is discussed.

A method of recording and evaluating the results of treatment of patients with chronic disorders of locomotion is described.

I am happy to acknowledge my indebtedness to Drs. Snodgrass, Oastler, and Scott, under whose care the patients were treated, and to Dr. Mackay for permission to publish.

References

Bovet, D., Fournel, J., and Charpentier, P. (1947). *Thérapie*, **2**, 115.
Carmichael, F. A., and Green, F. H. K. (1928). *Quart. J. Med.*, **22**, 51.
Hall, Sir A. (1943). *Lancet*, **1**, 193.
Neal, J. B., *et al.* (1942). *Encephalitis: A Clinical Study*. Lewis, London.
Olier, C. I. (1946). *Arch. Neurol. Psychiat., Chicago*, **55**, 388.
Ostow, M. (1943). Ibid., **50**, 342.
Sigwald, J., Durel, P., and Dumont, G. (1947). *Thérapie*, **2**, 108.

SUCCESSFUL TREATMENT OF TYPHOID CARRIER WITH PENICILLIN AND SULPHAMERAZINE

BY

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The problem of treating the chronic faecal carrier of typhoid fever has always been unsatisfactory. Infection of the gall-bladder (Boyd, 1944) is one of the most important features of the chronic carrier state. It forms the basis for advising cholecystectomy in an effort to eradicate bowel infection in chronic faecal carriers; but cholecystectomy is not uniformly successful for this purpose, and there are many who have submitted to the operation without deriving the anticipated benefit. It is clear that the gall-bladder is not the only focus in the alimentary tract where chronic infection can reside for many years.

The combination of sulphathiazole and penicillin was advocated by Bigger (1946), who noted, during *in vitro* experiments, that a combination of 4 units of penicillin and 10 mg. of sulphathiazole per 100 ml. would sterilize broth containing 70,000 typhoid bacilli per ml., and that one unit of penicillin and 10 mg. of sulphathiazole would sterilize broth containing 7,000 typhoid bacilli per ml.

Based upon Bigger's observations, the combination of penicillin and sulphathiazole has been tried during the acute typhoid illness and upon the chronic carrier state. The result of therapy during the acute illness has been disappointing; some observers record no improvement, though McSweeney (1946) noted that the toxaemia appeared to be lessened and that there were no complications due to ulceration of the bowel.

The successful treatment of two chronic faecal typhoid carriers, one of whom had previously submitted to cholecystectomy without change in his carrier state, was reported by Comerford, Richmond, and Kay (1946), who subsequently had the opportunity of carrying out a necropsy (Comerford, Richmond, and Kay, 1947) upon one of these patients who died from an unconnected cause. No cultures of *Salmonella typhi* were obtained from gut, biliary tract, urinary tracts, spleen, or lungs.

Fry, Jones, Moore, Parker, and Thomson (1948) treated 17 faecal typhoid carriers with massive doses of penicillin and moderate doses of sulphathiazole. They reported apparent cure in only three cases.

We would like to record a case treated with two separate courses of penicillin and sulpha drug, in which failure attended the first course, when the blood level of sulpha drug was low, and success followed the second course, in which it was high; the total penicillin dosage was practically the same in each course. It seems possible that previous failures by one of us (C.A.R.) in similar cases may be explained by an inadequate blood concentration of sulpha drug.

Case Report

A corporal aged 24 contracted severe typhoid fever in Egypt in January, 1946. He developed a faecal carrier state, for which he was given full doses of sulphathiazole (the exact amount was not stated), but there was no change in his carrier state. He was released from the R.A.F. eight months later, and was notified to his M.O.H. as a faecal carrier. He rejoined the R.A.F. the following year without disclosing that he was a chronic carrier. He had remained well, and had put on 2 stone (12.7 kg.) in weight.

In November, 1947, when examined for fitness for service abroad, he volunteered the information that he was a chronic carrier. His stool culture yielded a profuse growth of *Salm. typhi*, and he was admitted to this hospital. He was physically fit. Blood sedimentation rate, 3 mm. in 1 hour (Westergren). Fourteen daily specimens of urine yielded no typhoid bacilli. *Salm. typhi* was isolated from his bile obtained by duodenal intubation, and from consecutive specimens of faeces. Agglutinations were negative with "O" suspensions of *Salm. typhi* and *Salm. paratyphi* A and B, but gave a 1 in 20 agglutination with a VI suspension of *Salm. typhi*.

The man was anxious to remain in the R.A.F., but considered that cholecystectomy was too high a price to pay. In view of the uncertainty of response in clearing up the carrier state by surgery his refusal seemed reasonable. It was decided to try the effect of combined sulphamezathine and penicillin. Stools were examined immediately before beginning therapy and a profuse growth of *Salm. typhi* was isolated.

He was given 500,000 units of penicillin intramuscularly at four-hourly intervals, and 2 g. of sulphamezathine orally for two doses, followed by 1 g. four-hourly to a total of 32 g. Blood levels of sulphamezathine were carried out to determine the minimum concentration, which was anticipated to occur six hours after an oral dose of the drug. This assay showed 1.5 mg. of free sulphamezathine and 1.8 mg. of total sulpha drug per 100 ml. of blood. On completion of treatment the stools yielded a profuse growth of *Salm. typhi*.

Failure was attributed to the low blood levels of sulphamezathine, and it was decided to repeat the course, using sulphamerazine in place of sulphamezathine, since it allowed higher blood concentrations to be reached without excessive dosage. For various non-medical reasons nearly two months elapsed before starting the second course on Feb. 2, 1948.

Sulphamerazine, 2 g., was given orally at eight-hourly intervals for two doses, and subsequently 1 g. eight-hourly for seven days, to a total of 25 g. Penicillin, 400,000 units intramuscularly, was given concurrently three-hourly night and day, to a total of 24,000,000 units for the same time.

Assay of the blood for penicillin, tested three hours after an injection, yielded a concentration of 3.2 units of penicillin per 100 ml. of blood.

Assay of the blood for sulphamerazine, tested at eight hours after an oral dose—i.e., just before the next dose—yielded a concentration of 12 mg. of total sulphamerazine and 7 mg. of free sulphamerazine. Stools were cultured daily for fourteen days after cessation of the course, and all were negative for *Salm. typhi*. Stool examinations were continued for the next nine months; three daily specimens were pooled and examined each week, making a total of 117 stools cultured.

All cultures were negative for *Salm. typhi*, and it seems probable that the patient has been freed from the carrier state, though he will remain under observation for a further three months to complete a year's observation. It is noteworthy that his agglutination titre against a VI suspension of *Salm. typhi* had fallen from 1 in 20 to *nil*.

Discussion

The largest series of faecal carriers submitted to the synergistic action of penicillin and sulphathiazole consists of 17 cases reported by Fry *et al.* (1948); of these only three remained negative for long periods—two were still negative at 36 weeks and one at 48 weeks. Eight of their failed cases received a course identical with that successfully employed by Comerford *et al.* (1946) upon two cases. Such evidence suggests that the result of treatment is capricious and unpredictable.

Success in a single case has no particular significance, and it is published only because it may draw attention to the value of estimating blood levels during treatment. It is difficult to avoid the conclusion that blood sulpha levels in excess of 10 mg. per 100 ml. may be necessary to obtain the synergistic effect of penicillin. It is possible that the same therapeutic doses may give different blood levels in different individuals, and what seems an adequate oral dose may not create an adequate blood concentration. Sulphamerazine has the merit of giving high blood levels with moderate oral doses, and it has a minimum of unpleasant side-effects.

It is suggested that in any future series of cases treated by combined penicillin and sulpha drug the blood levels should be estimated during treatment to note what relation exists between blood concentration and successful treatment.

We wish to thank Air Marshal P. C. Livingston, C.B., C.B.E., F.R.C.S., K.H.S., Director-General of Medical Services, Royal Air Force, for permission to publish this paper.

REFERENCES

Bigger, J. W. (1946). *Lancet*, **1**, 81.
Boyd, W. (1944). *The Pathology of Internal Diseases*, 4th ed., p. 293. London, Kimpton.
Comerford, C. H., Richmond, H., and Kay, W. W. (1946). *Lancet*, **2**, 343.
—— —— —— (1947). Ibid., **2**, 808.
Fry, R. M., Jones, R. E., Moore, B., Parker, M. T., and Thomson, S. (1948). *British Medical Journal*, **2**, 295.
McSweeney, C. J. (1946). *Lancet*, **2**, 114.

Executive councils are included among the bodies on whom no development charge under the provisions of the Town and Country Planning Act, 1947, will be levied. They will make no claim against the £300,000,000 provided as compensation for loss of development rights in Part VI of that Act. Any claim which has already been submitted to the Central Land Board should be withdrawn.

"MYANESIN" IN THE TREATMENT OF TETANUS

BY

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The use of myanesin in tetanus was reported by Belfrage (1947) in two cases. Two further cases are described below, and these may be of interest in that they throw some light on the production of haemoglobinuria, a complication which has been reported in about twenty cases after myanesin.

Pugh and Enderby (1947) observed three cases of haemoglobinuria. The first urine passed after injection was discoloured, but no haemoglobinuria was found after two days. A death from renal anoxia after use of myanesin was reported by Hewer and Woolmer (1947), but it was pointed out by Mallinson (1948) that there were reasons for considering that myanesin was not the cause of death. A number of other cases have been described, but all were symptomless and cleared up spontaneously.

Hunter and Waterfall (1948) found myanesin useful in the control of epileptiform fits, a finding which is slightly at variance with those of Berger and Bradley (1946) that myanesin in non-paralysing doses had a powerful effect on strychnine-poisoning by depressing the reflex excitability of the spinal cord, but that the relative lack of antagonism to leptazol showed the midbrain to be influenced only when large doses were given. They thought that as myanesin does not affect consciousness or cause prenarcotic excitement it had no action on the cerebral cortex.

Davison (1948) suggested that the action was on the internuncial neurones in the spinal cord, because of the production of relaxation, apparently by reduction in muscle tone, without marked interference with respiration or voluntary movements. Berger and Bradley (1946) found that paralysis in animals was of longer duration in the hinder half than in the anterior portion.

Case 1

A farm labourer aged 40 suffering from tetanus was admitted to the Royal Victoria Infirmary on June 8, 1948. He had received a small splinter wound on the palm of the hand nine days before symptoms developed. A curious but probably entirely irrelevant fact was that he stated that his brother had died in childhood of "lockjaw." There was severe generalized muscular hypertonia, affecting particularly the gluteal muscles, abdominal muscles, and the muscles of respiration, and there was also very marked neck rigidity. The characteristic tetanic spasms occurred only half a dozen times. He was treated with sedatives, mainly intramuscular paraldehyde, but after about a fortnight his tolerance to these drugs had increased so much that they were practically valueless. Soon after admission, when the muscle tonus was very pronounced and was interfering greatly with respiration, he was given *d*-tubocurarine chloride ("tubarine") 7½ mg. intravenously and an equal dose intramuscularly. This abolished his muscle tonus but also paralysed all muscles of respiration. Artificial respiration was carried out with the Oxford insufflator for more than an hour. When subsequently he developed spasms these were treated with *d*-tubocurarine chloride, and artificial respiration was always necessary if sufficient was given to control the muscular movements. This was difficult, because the patient was edentulous and it was hard to secure effective inflation. On the fifth day after admission he developed a

cough, and two days later he had signs of patchy consolidation at both lung bases. These persisted for nine days. At a subsequent date myanesin in doses of 5 to 10 ml. was administered intravenously, with beneficial results. The abdominal and intercostal muscular rigidity disappeared for periods up to an hour after each injection, and respiration became much easier, but at no time did myanesin relax the rigidity of the posterior neck muscles or have much action upon the glutei. A total of 58 ml. of myanesin was given in 60 hours; haemoglobinuria was not seen.

In addition to the above treatment the patient was fed through a Ryle's tube, received penicillin to minimize the danger of respiratory infection, and was given massive doses of A.T.S. He recovered.

Case 2

A more serious case was admitted to the Royal Victoria Infirmary on June 18, 1948. The beneficial results obtained with myanesin in the previous case seemed to warrant its use, and in addition it was hoped to avert pulmonary complications by avoiding marked respiratory depression.

The patient, a man aged 58, had had an arthrodesis of the left knee performed four weeks previously, and was admitted about twenty-four hours after symptoms of tetanus made their appearance, the first being inability to insert his false teeth. An attempt to pass a nasal catheter failed on account of spasm of the pharyngeal muscles. He was given 200,000 units of A.T.S. Eight hours after admission the muscle spasms were recurring every two or three minutes; myanesin, 10 ml. intravenously, was given with considerable benefit, but a further 5 ml. became necessary thirty-five minutes later. A Ryle's tube was now passed with ease and glucose was given through it at hourly intervals. Penicillin was also given intramuscularly. An intravenous drip was set up containing 5% glucose in N/5 saline, to which myanesin was added in varying amounts as seemed to be dictated by the condition. It was found that the addition of more than 70 ml. of myanesin in 540 ml. of glucose–saline produced a white flocculent precipitate.

During 26½ hours the patient received 265 ml. of myanesin. The muscle spasms were completely controlled for considerable periods and the patient slept. At other times spasms occurred, but their severity was reduced. The continuation of these spasms in spite of the continuous intravenous myanesin drip necessitated the introduction of myanesin in quantities of 5–10 ml. from time to time; no sedatives were required. After 26½ hours haemoglobinuria occurred, the urine being deep red in colour. The intravenous drip was changed to glucose–saline without myanesin, and within a few minutes the muscle spasms became more frequent and more severe. Paraldehyde was administered intramuscularly, but failed to control the spasms, which increased in severity during the next two hours and terminated fatally.

The final spasm was extremely severe and caused marked cyanosis; *d*-tubocurarine chloride was given and artificial respiration undertaken with the Oxford insufflator, but without effect. At necropsy the naked-eye findings included the following:

1. The bladder contained about a quarter-pint (140 ml.) of urine, which was only slightly smoky in appearance; the colouring matter had decreased considerably in the two hours before death.

2. The kidneys were normal in appearance, colour, and consistency, and showed no abnormality on section. This is surprising in view of the softening which is likely to occur in the kidneys of patients dying from tetanus.

3. In spite of the haemolysing action of tetanus toxin and of post-mortem changes, little or no haemoglobin could be detected by the naked eye in serum removed at necropsy.

4. There were many severe haemorrhages into muscle, including particularly the left quadriceps femoris and the two psoas muscles.

5. The surgical wound in the left knee appeared healthy, but on bacteriological examination a growth of tetanus bacilli was obtained.

Discussion

The first case apparently had an incubation period of nine days, but there is some doubt about this because the site of infection was not definitely proved. It is very probable that the infection occurred through the splinter wound of the hand, but it was noticeable that no local symptoms of tetanus were associated with it.

In the second case these local signs were fairly marked, spasms of the left leg being severe enough to produce considerable muscular haemorrhages.

It is a generally accepted statement in the textbooks that the toxin of tetanus acts upon the ventral horn cells of the spinal cord. If this be true, the efficacy of myanesin suggests here that its main action is upon the spinal cord, since there is reason to believe that in normal doses it does not act peripherally. Certainly, in the second case, to which such a large dose of myanesin was administered, there was no dulling of consciousness, although sleep did occur from fatigue.

The four-weeks incubation period in the second case was surprising in view of the severity of the illness. It is possible that the million units of penicillin which he had received after operation may have lengthened the incubation period without comparable mitigation of the attack. It may be remarked that, although penicillin destroys the bacillus of tetanus *in vitro*, it is unlikely to do so *in vivo*, because, the bacillus being anaerobic, it flourishes in areas cut off from blood supply and consequently inaccessible to penicillin. Various sources of infection have been considered: the grey wool with which the limb was packed before being put into plaster was "stoved" before use and was separated from the wound by complete sterile dressings and bandages; the sulphanilamide powder which was introduced into the wound was alleged to be sterile; and no other cases have occurred, which suggests that the catgut was not at fault. There remains the possibility that infection had occurred during a previous injury to the knee, of which many were sustained at football, and had lain dormant until activated by the interference with the blood supply which may have occurred following operation.

These cases, although one of them unfortunately ended fatally, indicate not only that myanesin acts efficiently in controlling the spasms of tetanus but also that its use in massive doses will bear further investigation. Tolerance did not develop, which was in marked contrast to the reaction of the first case to sedative drugs.

Haemoglobinuria occurred in the second case, but in the short space of two hours which the patient lived after the myanesin was discontinued the urine had become almost free from haemoglobin. This supports the view that the haemoglobinuria may be temporary and might perhaps be disregarded. The most important practical attribute of myanesin was its ability to control muscle spasms and to relax hypertonus without paralysing the muscles of respiration, so that artificial respiration was unnecessary.

Summary

The reported cases of haemoglobinuria after myanesin are mentioned. Death has probably never resulted from this complication.

The evidence concerning the site of action of myanesin is recapitulated, and its value in tetanus supports the belief that it acts on the spinal cord.

Two cases of tetanus are reported. The first patient was treated mainly by sedatives and *d*-tubocurarine chloride ("tubarine") and received 58 ml. of myanesin. He recovered and had no haemoglobinuria. He did, however, have signs of pulmonary consolidation. The second, a much more severe case, was treated solely with myanesin, which efficiently controlled the spasms until haemoglobinuria developed, after 265 ml. had been given in 26½ hours. The myanesin was then discontinued; sedatives were ineffective, and he died two hours later. During these two hours haemo-

globinuria almost disappeared, and the kidneys were normal to the naked eye and on section.

The entry point of the infection is discussed.

Further investigation of myanesin in the treatment of tetanus seems to be warranted.

We wish to acknowledge the courtesy and promptitude with which a large consignment of myanesin was dispatched to us by British Drug Houses, Ltd., in response to the urgent action of Mr. Foggan, the chief pharmacist.

BIBLIOGRAPHY

Belfrage, D. H. (1947). *Lancet*, **2**, 889.
Berger, F. M., and Bradley, W. (1946). *Brit. J. Pharmacol.*, **1**, 4; 265.
Cowen, J. (1948). *Lancet*, **1**, 965.
Davison, M. H. A. (1948). *British Medical Journal*, **1**, 544.
Hewer, T. F., and Woolmer, R. F. (1947). *Lancet*, **2**, 909.
Hunter, A. R., and Waterfall, J. M. (1948). Ibid., **1**, 366.
Mallinson, F. B. (1948). Ibid., **1**, 41.
Ogilvie, T. A., *et al.* (1948). Ibid., **1**, 947.
Pugh, J. I., and Enderby, G. E. H. (1947). Ibid., **2**, 387.

A "MINOR" INJURY OF THE TERMINAL PHALANX

BY

F. I. POWELL, B.Sc., M.B., B.Ch.

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Terminal phalangeal injuries are often regarded with a great deal of indifference and, indeed, sometimes scorn. They are the Cinderella of hand injuries, and yet these injuries are amongst the commonest in casualty departments, causing as they do a varying amount of pain, discomfort, and unemployment to the patients.

The particular injury under review here is a common one, a crush injury to the terminal phalangeal area, usually caused by a heavy weight—e.g., an oxygen cylinder or metal bar falling on to the finger. The finger is caught by the object and crushed against the floor or a wall, the lesion produced being somewhat characteristic. There is always a degree of "dislocation" of the nail; the proximal end may be dislocated wholly or partially from the nail-bed, the cuticle usually being damaged with this uplift as well. The soft tissue is split, the amount of laceration varying a great deal; there is some oozing of blood; and the radiograph may show a fissure or an appreciable fracture of the terminal phalanx.

I would like to advocate here a procedure that has yielded good results even with the most badly crushed fingers, the essential feature being the removal and replacement of the nail.

Method

The hand is cleansed of any grit and oily material by a good soak and "scrub" in C.T.A.B. Procaine 2% is then injected by a fine needle lengthwise along the margins of the nail (Fig. 1). When the finger is anaesthetized the nail is lifted or cut clean off and placed in C.T.A.B. and then manicured and trimmed with scissors.

On examination of the nail-bed area the amount of laceration and dirt is often surprising. There is always free oozing of blood, and a fracture of the terminal phalanx may be clearly visible. If bleeding is severe the usual attempts to stop it—haemostats or topical thrombin—are made. After cleaning the area with C.T.A.B., suturing of soft tissue is carried out and the nail-bed is sprinkled with sulphanilamide or penicillin powder. The clean nail is then placed in its correct anatomical position and sutures of either horse-hair or silkworm-gut are passed through the nail at about four points to anchor it to the finger (Fig. 2). The whole is then covered in "tulle gras," a *firm* dressing is put on, and a plaster shell is finally applied.

FIG. 1.—A schematic drawing of an injured phalanx. Sites of procaine injection (P). The nail is avulsed proximally, showing the nail-bed.

FIG. 2.—Nail replaced in correct position by four sutures.

An injection of A.T.S., A.G.G.S., and 250,000 units of penicillin is given. The dressing is removed a week later, when it will be found that the sutures can be removed without difficulty: the nail does not drop off, as might be expected, but stays on for a variable but appreciable time. There is usually a small haematoma under the nail, but the whole finger is pleasingly free from pain and infection. A powder dressing, with or without another plaster shell, is applied for another week. At the end of about three weeks the patient's finger is quite satisfactory and the cosmetic result good. A new nail will eventually form.

On the other hand, in cases in which the nail has been left dislocated proximally excessive granulation tissue constitutes a troublesome complication at the break, and often pus forms under the nail. Where the nail is avulsed and not replaced there is often oozing of blood for a few days, for which repeated dressings of the area may be necessary, and even after two weeks the finger may be very tender.

Recently a man received this type of injury when working in a dockyard. The finger had not been cleaned, but was placed straightway in a plaster cap with just a gauze dressing. When we saw him a month later, he having moved from the town where he sustained the injury, his finger was still in plaster, and on its removal the terminal phalanx was one mass of foul-smelling slough. It took many weeks to get anything like a satisfactory result for him.

The method outlined in detail for these injuries is a satisfactory one; it is simple to perform and can be carried out with a slight amount of material. It is well within the range of minor surgery work of general practice, and it can be performed with complete confidence on the practitioner's part.

A memorandum issued by the Department of Health for Scotland states that under the National Health Service hospital almoners should be released as far as possible from office duties and allowed to concentrate fully on the medical social work for which they have been specially trained. The duties of the almoner should properly include investigation and interviews to provide understanding of the social and personal background of the patient, and in particular to give the doctor information of this kind which is relevant to diagnosis and treatment; social action to minimize personal anxieties; helping the patient in his adjustment to home life, to resume employment, or to a continuing disability; and advising on the planning of facilities for patients. At present the supply of trained almoners is well below demand, and it is therefore particularly important that their services should be confined to these tasks for which they have special qualifications. The salary of an almoner holding the certificate of the Institute of Almoners is on a scale of £340—£390 per annum. Head almoners earn up to a maximum of £660.

Medical Memoranda

Dangerous Symptoms after Injections of Heroin (Diamorphine)

It is thought that two recent experiences of the dangers of heroin should be added to the available information.

CASE 1

A woman aged 40 spent a fatiguing day in town with her daughter. She travelled 230 miles by rail, dined on the train, did not fancy the meal, and reached home very tired. Next day she vomited repeatedly, diarrhoea developed, and by evening she appeared to be seriously ill. She sent for X.Y.Z., who had known her well for twenty-five years. He found her pale and rather limp. Her pulse was rapid, the systolic pressure 115 mm. Hg, and the breathing shallow and rapid. She stated repeatedly that she felt very ill. There was no rise of temperature nor any signs in abdomen or chest. He decided to give a morphine sedative to check the vomiting and diarrhoea, and chose heroin, as it is said to be less liable than morphine to cause nausea. In three or four previous cases he had injected 1/6 gr. (11 mg.) of heroin with little apparent effect. He therefore took two tablets of this dose, specially prepared for injection, dissolved them in water, and injected them subcutaneously.

He waited (fortunately) to see the patient comfortable, and was at first gratified to note that her distress diminished; she was soothed and felt sleepy; she remarked drowsily, "It's coming over me." Then, 10 to 15 minutes after the injection, almost suddenly, she became deeply unconscious and unrousable. Inspirations became rapidly shallower, with longer and longer intervals; there was deep cyanosis, with complete muscular relaxation and an imperceptible pulse. The pupils were very small—not quite pin-point. X.Y.Z. reversed his therapeutics. He injected nikethamide 0.5 g., removed the pillows, raised the foot of the bed, sent a very urgent message for another doctor, and began artificial respiration. I arrived in ten minutes. By then respiration had entirely ceased, there were no reflexes, and the extremities were cooling. The only hopeful sign was that the heart sounds were faintly audible and the pulse was occasionally perceptible. A catheter specimen of urine was free from albumin, sugar, and ketones. Lobeline 0.003 g. was injected. Artificial respiration was continued and rhythmic traction was applied to the tongue. Oxygen and carbon dioxide were sent for. The former arrived in fifteen minutes, and its administration quickly lightened the cyanosis and seemed to produce some general improvement. After about twenty minutes the patient began to make very feeble respiratory gasps at long intervals. The intervals gradually diminished and the respirations deepened, so that after another twenty minutes artificial respiration could be stopped, though the oxygen was continued a little longer. By the time the carbon dioxide arrived its use was thought unnecessary.

About four hours after the injection of heroin the patient could be roused sufficiently to recognize her husband and to be spoon-fed with strong coffee. The pupils were still minute, and she continued to be extremely drowsy. Three hours later the respirations again became alarmingly shallow and infrequent and there was cyanosis, but recovery took place without major measures.

Next day the patient was drowsy, weak and feeble, and had contracted pupils. There was much nausea, with some vomiting. Coffee and glucose were given per rectum. Recovery proceeded evenly for five days; then there was some return of nausea, vomiting, weakness, and a feeling of respiratory oppression. In another five days recovery was practically complete.

No further light was obtained on the original illness. No more signs developed; the temperature was never raised; and no albumin, casts, inflammatory cells, or blood corpuscles were found in the urine. Agglutination tests were completely negative for *Salmonella paratyphi* A and B, *Bact. sonnei*, *S. typhi murium*, Gaertner's bacillus, and *Br. abortus*. No non-lactosing-fermenting bacilli were obtained in cultures of the faeces. The daughter was unaffected.

CASE 2

This patient, a woman aged 65, had arteriosclerosis, a systolic blood pressure of 230 mm. Hg, and was liable to attacks of severe epistaxis. X.Y.Z. was summoned at 2 a.m., with a report of very severe vomiting for an hour, the face being drawn to one side, and numbness of the right hand. On arrival he found no anaesthesia or paresis, and could not ascertain to which side the face was thought to have been drawn. The patient and her relatives were very restless, anxious, and alarmed. X.Y.Z. injected 1/6 gr. of heroin subcutaneously, taking a tablet from a fresh tube. The patient seemed inclined to settle.

He returned in half an hour and found the patient unconscious, pale, and pulseless. Her jaw was dropped, her features relaxed, her eyes half open, and the pupils very small. She was breathing only by spasmodic stertorous inspiration at long intervals. Artificial respiration was started, and this, with various vigorous sensory stimuli, roused the patient sufficiently to ensure automatic breathing. She remained very drowsy till next morning, but no more alarming symptoms developed.

These two cases do not form an extensive series, but further experience is not being invited. I have to thank X.Y.Z. for collaboration in this note.

CRANSTON WALKER, M.D.

Skull Closure by Acrylic Plates

This note describes two cases of large frontal skull defects treated in India by means of acrylic plates. The method of Small and Graham (1945) was adopted with minor simplifications. The impression material used was dental wax, sterilized by heating to smoking temperature then autoclaving. A rim of lead was used to hold the wax, and allowed of firm pressure. No undercuts were reproduced—an advantage in this particular work. The plate was of skull thickness, perforated, and curved by eye to fit a model of the skull.

At the first operation the skull defect was step-cut by a cylindrical dental burr and a chisel, and a key was introduced at two points. At the second operation, performed a month later, the completed plate was wired in with stainless steel. The plates were sterilized by scrubbing with soap and water, followed by immersion in 1% mercuric chloride in water for three days. This method produced no warping or softening of the acrylic substance and no deposition of heavy metal on the plate. These Indian patients were transfused with whole blood at the first operation to keep up a satisfactory level of haemoglobin, and chemotherapy and aspiration of fluid were employed on the first, third, and fifth days.

CASE HISTORIES

Case 1.—This patient, a Gurkha, had lost about two-thirds of his left supraorbital margin, the anterior portion of the orbital roof, and a large area of frontal bone. Following the wounding he had had a fungus cerebri for about six months. At the first operation a rotation flap was used to cover the defect with sound scalp. The result remained satisfactory when he was last seen three months after the second operation.

Case 2.—Before and after operation

Case 2.—This was a Sikh who had lost a large portion of the fronto-temporal region. Debridement by Major G. M. Lunn, R.A.M.C., 72 hours after the wounding, secured first-intention healing. The plate was inserted three months later, and continued to be satisfactory during two months' observation.

Acrylic resin, of all inert materials, has a strong claim for suitability in frontal defects, where by its use admirable cosmetic results can be achieved by the exercise of ordinary operative skill. The limiting factor in regard to size is the tension of the overlying scalp, not the durability of the plate. Granulation tissue grows through perforations in the plate and improves blood supply to the scalp, but ties it down and reduces its mobility.

Thanks are due to Sergeant Dewar, A.D. Corps, for preparing the trays and plates, and to Major N. Reichman, R.A.M.C., for his aid with the anaesthetics and the drilling operations.

E. A. TURNER,
Major, R.A.M.C.

G. FOSTER,
Major, A.D. Corps.

REFERENCE

Small, J. M., and Graham, M. P. (1945). *Brit. J. Surg.*, **33**, 106.

Dr. Barnardo's Homes state that they admitted 1,108 boys and girls in 1948.

Reviews

THE ANNUAL MEETING, 1948

Proceedings of the Annual Meeting, 1948. British Medical Association. (Pp. 415. £1 15s., postage 1s. 3d. extra.) London: Butterworth and Co. 1949.

The B.M.A. is to be congratulated on following a precedent, set at the Cambridge meeting in 1919, of publishing in one volume the papers given at the Association's meeting last summer. Between Sir Lionel Whitby's presidential address on "The Changing Face of Medicine" and Sir Henry Dale's popular lecture, "Accident and Opportunism in Medical Research," are sandwiched the proceedings of the nineteen scientific sections. To read the titles of the papers reveals the breadth of the discussions and the comprehensive manner in which all the growing points of medical science were reviewed.

From such a wealth of material it is difficult to choose communications for special comment. In the combined meeting of the Sections of Medicine and Surgery, Dr. R. H. Smithwick's review of his results from the surgical treatment of hypertension will be read with interest. Mr. W. L. Harnett's statistical survey of the results of treatment in carcinoma of the breast is an actuarial *tour de force* of outstanding importance, and will provide a yardstick for assessing the value of treatment for years to come. Additional random selections, such as the discussions on neonatal mortality and morbidity, on the radiological changes in the small intestine in nutritional disorders, and on the antihistamine substances, show the wide scope and the topical character of the Sections' deliberations. All who attended the Association's first annual meeting since 1939 will be anxious to possess this book, both for the scientific value of the communications it contains and as a reminder of the peaceful charm and gracious hospitality of Cambridge.

R. BODLEY SCOTT.

B.C.G. VACCINATION

Vaccination par le B.C.G. par Scarifications Cutanées. By L. Nègre and J. Bretey. Preface by Professor A. B. Marfan. Second edition, revised and enlarged. (Pp. 116; 10 figures. 180 francs.) Paris: Masson et Cie. 1947.

Most of the early work on vaccinating human beings with B.C.G. was done by the oral route. The disadvantage of this method was that only about one-third of the vaccinated subjects became sensitive to tuberculin after it. The introduction of the intradermal method, now so widely used in Scandinavia, remedied this defect but brought with it disadvantages such as local ulceration and occasional glandular enlargement. Rosenthal, in Chicago, experimented with multiple-puncture and reported very favourable results with it, obtaining early development of tuberculin sensitivity and absence of any unpleasant local reaction. Dr. Nègre and Dr. Bretey, in Paris, modified this method, replacing skin puncture by scarification. This monograph records their findings.

The method is simple and resembles that used with smallpox vaccine lymph. The skin is cleaned, a few drops of a fresh suspension of B.C.G. containing 75 mg. of organisms per ml. are placed on it, and a suitable number of scarifications are made through the drops with a sharp needle. The number and length of the scarifications vary from four scratches each 0.5 cm. long in the newborn infant to ten scratches each 1.5–2.0 cm. long in the adult. A simple compress soaked in the remains of the B.C.G. in the phial is applied to the site of inoculation and removed 24 hours later. The small scabs become detached in four or five days. After three to four weeks the scratches become red and swollen, looking rather like a keloid. This inflammatory reaction gradually disappears, and in two to five months a barely perceptible linear scar remains. A focal glandular reaction is rare; it has been reported 30 times in 70,000 vaccinations.

Tuberculin sensitivity develops three to four weeks after vaccination. The figures provided are incomplete, but they suggest that about 90% of vaccinated persons react to 0.1 ml. of 1/100 tuberculin in one to three months. Revaccination is recommended if Mantoux-conversion does not occur. Infants born into tuberculous families should be segregated, tested with tuberculin twice at two months' interval, and not vaccinated unless both tests are negative. They should not be returned to their families until they have become tuberculin-sensitive. Every six to twelve months they should be retested, and vaccinated again if they become negative. The scarification method has the double advantage of simplicity and innocuity; provided experience shows it to confer as high a degree of allergy as that following intracutaneous inoculation or multiple puncture, it may well be adopted as the method of choice.

G. S. WILSON.

HOMOSEXUAL BEHAVIOUR

Sex Variants. A Study of Homosexual Patterns. By George W. Henry, M.D. With sections contributed by specialists in particular fields. Sponsored by Committee for the Study of Sex Variants, Inc. (Pp. 1,128; illustrated. £2.) New York: Paul B. Hoeber, Inc. London: Hamish Hamilton. 1948.

This ponderous volume adds one more to the numerous and interesting American studies on variations in sex life. The subject is not perhaps quite so important to warrant such an enormous expense of labour. Such studies as have been made of marriage, for instance, have shown that deviations less extreme than homosexuality from the average pattern of sexual behaviour are of less consequence for success or failure than are the temperaments of the partners. The medical significance of sex deviations is even less than their social importance; it has yet to be shown that homosexuals are more liable to psychiatric illness than are normal people. American psychologists and psychiatrists seem to be constantly holding up their hands in wonder at the great range and variety of human sexual behaviour, and to have a tireless delight in cataloguing its details. Once the point is taken—and it was made many years ago by Havelock Ellis—that so-called perversions of all kinds are shown to a minor degree by a considerable proportion of healthy and socially valuable members of the public, there seems little possibility of further advance along the line of mere description.

Dr. Henry's book is almost purely descriptive. By far its greater part is taken up by long, intimate, and detailed histories of forty homosexual men and forty homosexual women. This is a great improvement on the usual convention of obtaining data by questionary, on whose reliability little confidence can be placed. He gives the family histories *in extenso*, with fairly vivid sketches of the personalities of the nearer relatives and of early emotional life. The life history of the subject, not only its sexual aspects, is fully described, and there are anthropometric records of skeletal measurements and secondary sex characters. The last are the only findings dealt with statistically; and it is disappointing, if not unexpected, that so little emerges.

Dr. Henry provides no discussion and no conclusions, but he has six pages of "Impressions." He believes that the homosexual is in part a by-product of civilization, and is so because of his inability to maintain a home and rear children. The deviation from normality is due to constitutional deficiencies, to the influence of family patterns of sex adjustment, to lack of opportunity of normal development. Tendencies to femininity in the males and to masculinity in the females of a family are likely to result in the appearance of homosexuals in the next generation. People are more and less of one and the other sex, and not scientifically classifiable as fully male or female. The male is more vulnerable than the female to distortions of psychosexual development. This is practically all that is said on the subject of aetiology.

The main role in both causation and prophylaxis is assigned to sex education. He makes some sensible if unoriginal remarks on social aspects. He condemns present legal defences; society should classify homosexuals into those who are and those who are not apt to offend, and have different methods for dealing with either. Finally, in his comment that males should be encouraged in tendencies to masculine aggression, females in the converse attitude, Dr. Henry makes an interesting reflection on American society. Gorer has discussed the American system of educating boys almost exclusively by school-mistresses, and puts down to it male lack of dominance

and homosexual tendencies which need constant defence; and according to the Kinsey Report 37% of American males have some homosexual experience. So it may be there is force in Dr. Henry's recommendation.

ELIOT SLATER.

PHYSIOLOGY FOR STUDENTS

Human Physiology. By F. R. Winton, M.D., D.Sc., and L. E. Bayliss, Ph.D. Third edition. (Pp. 592; 248 illustrations. 25s.) London: J. and A. Churchill. 1948.

This work was deservedly popular with medical students in its earlier editions, but the last one has been out of print for some time, and the appearance of the new edition has been hopefully awaited by students and teachers because there is a lack of small textbooks of physiology that can help the student by presenting the subject simply and in good perspective so that it can be seen as a whole. Teachers in general are fully aware of the recommendations, so often made, to review their courses often and to prune them of unnecessary detail and of material irrelevant to the medical student. A similar duty is laid upon the authors of textbooks.

"Winton and Bayliss" is a work with a point of view. According to the preface the book is intended to present a "coherent picture of the whole subject" to the medical student, in whom the "attitude of an alert explorer" is to be encouraged, and on this claim it must be judged. It seems to be less successful in its aim than the previous editions were. The book is longer, although there are fewer pages because of resetting and the use of smaller types; it is well up to date. Many of the diagrams have been redrawn and new ones added, and yet one has some uneasiness about its worth as a whole to the medical student. There is much factual information; indeed, in some chapters, particularly in those on the nervous system and renal function, a conflict between the necessity of including facts and a desire for brevity may have made understanding difficult for the average student. The authors discuss the various systems in fairly conventional fashion, but there seems to be a lack of balance between different chapters in the treatment and in the amount of material included. This is probably because, besides the two named authors, there are thirteen other contributors who have written one or more chapters on the subjects in which they are specialists. This is a trend which has appeared already in the compilation of larger textbooks, and it is noteworthy that two standard American works have now become collections of monographs. The reason given, of course, is that it is impossible for any one individual to keep in touch with the advance of knowledge on all fronts. Nevertheless, if a book is to be written by a committee it seems desirable that it should come from one laboratory and have a common viewpoint, or alternatively that editors should overwrite contributions quite ruthlessly. As it is, the chapters in this book seem to lack a freshness and individuality that might have been expected—only one or two of them are likely to inspire the student—and the authors have not supplied the thread to bind them into a whole.

The book will be popular because of its moderate size and its former reputation, but opportunities have been missed of introducing students to physiological thought and outlook by relying too much on experts and diversity of interests.

A. HEMINGWAY.

It is somewhat paradoxical that the authors of *Milk Products* (Dr. Wm. Clunie Harvey and Mr. Harry Hill, F.R.San.I.; second edition; H. K. Lewis; 30s.) should have chosen to re-edit their book on milk products at a time when so many of the articles they discuss are unobtainable in this country. Ice-cream is but a caricature of its real self, cream is unobtainable, and the processed milks are in short supply. And what the effect on cheese-lovers will be of reading about the mode of manufacture of Lancashire, Wensleydale, Stilton, or Blue Vinney among the English cheeses, or of Brie, Limburger, or Pont l'Evêque among the foreign, is difficult to conjecture. However, the book is primarily intended not for lovers of good food or for the nutritional expert but for public-health workers who are responsible for controlling the hygienic quality of the finished product. For their need it caters well. The new edition, which has been brought fairly well up to date, contains 80 illustrations of manufacturing plant, and should be particularly useful to sanitary inspectors.

BOOKS RECEIVED

[*Review is not precluded by notice here of books recently received*]

Collected Papers of the Mayo Clinic and the Mayo Foundation. Edited by R. M. Hewitt, B.A., M.A., M.D., and others. Vol. 39. (Pp. 871. 63s.) London: W. B. Saunders. 1948.

Papers presented during 1947.

Racial Variations in Immunity to Syphilis. By C. N. Frazier, M.D., and Li Hung-Chiung, M.D. (Pp. 122. 14s.) London: Cambridge University Press. 1949.

A study of the different responses to syphilitic infection in Chinese, Europeans, and Americans.

Studies of Chronic Pyelonephritis. By F. Raaschou. (Pp. 260. Kr. 20.) Copenhagen: Ejnar Munksgaard. 1948

A translation of the original Danish monograph

The Achievements of BCG Vaccination. By G Hertzberg. (Pp. 224. No price.) Oslo: Johan Grundt Tanum. 1948.

A study based on the work of the Tuberculosis Department of the Oslo Public Health Service.

Physics and the Surgeon. By H. S. Souttar, D.M., M.Ch., F.R.C.S. (Pp. 60. 7s. 6d.) Oxford: Blackwell Scientific Publications. 1948.

Physics applicable to surgery.

Les Fondements de la Géographie Humaine. By Max Sorre. Vol. 2. (Pp. 608. 1,100 francs.) Paris: Armand Colin. 1948.

A treatise on the adaptation of man to his environment.

Exposés Annuels de Biochimie Médicale. Edited by M. Polonovski. 9th series. (Pp. 318. 1,000 francs.) Paris: Masson et Cie. 1948.

A collection of twelve lectures in biochemistry from the Faculty of Medicine of Paris.

Twenty-third Meeting of the Northern Surgical Association. Official Transactions. Edited by E. Dahl-Iversen, M.D. (Pp 502. Kr. 24.) Copenhagen: Ejnar Munksgaard. 1948.

Collected papers

La Physiologie Post-Traumatique de l'Articulation. By T. Marti. (Pp. 77. 5 Swiss francs.) Basle: Benno Schwabe and Co. 1948.

A monograph on arthritis.

Science News. No. 10. Edited by J. L. Crammer. (Pp. 160. 1s. 6d.) London: Penguin Books. 1949.

Popular science.

Max Neuburger. By E. Berghoff. Vol. 3. (Pp. 144. Sch. 40.) Vienna: Wilhelm Maudrich. 1948.

A biography.

Das Weltbild der Medizin von Heute. By H. Glaser. (Pp. 140. Sch. 28.) Vienna: Wilhelm Maudrich. 1949.

An account of some recent advances.

Mononucleosis Infecciosa. By J. J. P. Macia and P. V. Marce. (Pp. 444. No price.) Barcelona: Ediciones Byp. 1948

A short Spanish monograph.

Penicillin in der Inneren Medizin. By K. Scheidler. (Pp. 64. M. 3.30.) Berlin: Berliner Medizinische. 1948.

A short description of penicillin treatment.

Das Panaritium. By W. Pohl. (Pp. 192. $5.) Vienna: Wilhelm Maudrich. 1948.

An illustrated description of the treatment of hand infections.

Die Lungentuberkulose. By W. Roloff. (Pp. 138. M 9.60.) Berlin: Springer. 1948.

An introduction to the study of tuberculosis.

Ear, Nose and Throat Nursing. By J. H. Neil, C.B.E., D.S.O., F.R.A.C.S., F.A.C.S., and T. H. Neil, D.L.O., F.R.A.C.S. 4th ed. (Pp. 157. 9s.) London: H. K. Lewis. 1948.

Notes for sisters and housemen.

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SICKNESS IN ENGLAND AND WALES

When the second World Health Assembly meets in Rome on June 13 this year a comprehensive programme and budget for 1950 will be submitted to it by the WHO Executive Board. The main attack is on communicable diseases in under-developed areas of war-devastated countries, and other proposals are concerned with the promotion of maternal and child health and mental health, the prevention and treatment of tuberculosis and of venereal diseases, health education and nutrition, sanitation, and occupational hygiene. Among the subsidiary projects is an extension of WHO's work in health statistics. Perhaps this is rightly classed as subsidiary, and certainly many persons would regard it as prosaic and dull, yet much of the fundamental work listed above must inevitably be based upon sound vital statistics. Without them the selection of the most urgent problems to attack is seriously handicapped, and the measure of the effects of that attack is almost impossible. This, indeed, was clearly recognized by the first Assembly in its adoption of the Sixth Revision of the International List of Causes of Death, now greatly expanded to cover causes of sickness as well.

It is in this latter field—the frequency and nature of illness—that an extension of work in health statistics is to be most desired, and such a development is in fact being given much attention in many countries. "The health of the nation was never better" is, perhaps, true, but it would be more convincing if we knew how often it was ill as well as the rate at which it died. To collect comprehensive statistics of sickness is not, however, an easy task. We have already discussed the proposal of the Ministry of National Insurance to study a sample of the sicknesses leading to claims to benefit[1]; whatever the value of these records—and it may prove considerable—the resulting statistics can relate only to the working population and only to those who lose time from work (usually for three days or more) because of their illness. The Ministry of Health is experimenting with sample returns of patients entering hospital; taken alone, these can show only a small part of the picture of the incidence of illness. Some of the advantages and disadvantages of these statistics were argued at length at a meeting of the Royal Statistical Society.[2] Three other sources of national figures—the notification of infectious diseases, the sickness investigation conducted by the Social Survey, and the food rationing figures—are discussed by Dr. Percy Stocks with customary statistical skill and imagination in the second of the occasional publications issued this week by the General Register Office.[3]

The best known of these sources is undoubtedly the first group—the notifiable diseases—the statistical value of which was greatly increased in 1944 by the publication of the quarterly returns for different age groups for each sex. It is well known that notification is not complete, and Stocks compares the recorded rates of attack with other available data to assess the degree of completeness. Thus at the notified rates of scarlet fever in 1944–7 approximately 10% of children would be attacked before age 15; this figure agrees reasonably well with the number of children whose histories have revealed an attack of scarlet fever before their fifteenth birthday in such different places as English public schools, the borough of St. Pancras, and towns in the U.S.A. On the other hand, from the notifications of whooping-cough it could be calculated that only 13–14% of children are attacked before the age of 15, whereas all available data on the history of previous attacks collected in the U.S.A. and this country indicate that the true figure is 60–70%. By these and similar means Stocks is led to conclude that notification is fairly complete for acute poliomyelitis, cerebrospinal fever, diphtheria, and scarlet fever, and that the notifications of other diseases are about 90% of the total in the case of respiratory tuberculosis, 80% in the enteric fevers, two-thirds in measles, one-third to one-quarter in pneumonia, one-quarter to one-fifth in whooping-cough, and a merely fractional amount in the case of dysentery. He is here, of course, thinking of illness in terms of typical clinical cases and excluding subclinical attacks, doubtful cases, and evidences of infection without definite clinical symptoms. He speaks with some emphasis about the last, stressing that the criterion for notification is that the person is "suffering from" the disease and that "any departure from this criterion is likely to lead to confusion not only in statistics but in administration." Diagnosis can be greatly aided by bacteriological, biological, and radiological tests, but the tests themselves are not measures of disease incidence. Clearly the distinction must sometimes be very hard to draw. He maintains, for instance, that "thoracic shadows on a skiagram" do not constitute the presence of disease "unless accompanied by symptoms attributable to the disease." This may lead to some awkward problems. For instance, two patients might be found by mass radiography to have early pulmonary tuberculosis, neither having any symptoms or knowledge of departure from health; one then goes to a sanatorium and the other refuses treatment. Are both, one, or neither notifiable? With such tests the notifications of some diseases may well rise artificially, since cases are more easily detected, while the numbers of others may rise if in the new Service the doctor's help is more frequently invoked than in the past. Study of recent weekly returns provides no evidence in the case of the common infectious diseases of childhood that that is yet happening.

The technique of the Social Survey investigation into sickness incidence is the interviewing at the beginning of each calendar month of small but representative samples of the whole civilian population aged 16 and over. A note is made of the illness and injuries reported by each person to have taken place during each of the two preceding

[1] *British Medical Journal*, 1949, **1**, 533.
[2] *J.R. statist. Soc.*, 1948, **111**, 14.
[3] *Sickness in the Population of England and Wales in 1944–1947*, 1949. London: H.M.S.O.

calendar months. From this material Stocks calculates a number of rates. Thus in the year 1946–7 each 1,000 men aged 16 or over reported an average of 1,169 illnesses and injuries per month, while the corresponding rate per 1,000 women was 1,617. Alternatively, the number of persons ill during the month may be used in place of the number of their sicknesses; this reduces the above rates to 619 per 1,000 men and 713 per 1,000 women. To another figure Stocks gives the rather unattractive name of the *aegrescence rate*, which he defines as the number of persons who started an illness during a defined period of time; it leaves out of account those who continued to suffer from an illness starting previously. Thus in 1946–7 out of each 1,000 civilians an average of 44 men and 51 women per month started a defined illness (other than minor), and 275 men and 336 women started a minor or ill-defined complaint. The mean days of incapacity and the numbers of medical consultations can also be computed. At these adult ages the latter figure was about five consultations per person per annum, rising from four per person at ages 16–45 to seven or more at ages over 65.

While it is clearly necessary at present to experiment with various forms of calculation and presentation, there does seem to be some risk of obscuring the wood with too many trees. It is to be hoped it will be possible in time to set out the basic sickness incidence in perhaps a couple of rates without any serious loss. Some workers might feel that it would be no serious loss if the mass of very minor or ill-defined illness was eliminated instead of, as at present, frequently dominating the picture. On the other hand, it can be retorted that the whole *raison d'être* of the Social Survey approach lies in these minor illnesses, since they call for no medical attention or sickness benefit, and their contribution to the record of ill-health can be found in no other way. The statistics to which they lead indicate, for instance, that one person in eight developed a cold during the average month—a figure suggesting that each adult has an average of 1.4 colds per year—that about one in 500 developed migraine in a month, one in 2,000 herpes, one in 6,000 ringworm, one in 14,000 scabies, and one in 17,000 mumps.

Stocks endeavours to check the accuracy of diagnosis in these self-reported illnesses by comparing the rates of incidence calculated from these figures with the rates calculated from figures obtained from the priority food rationing scheme or from notifications of disease. On the whole the agreement is encouraging, though the comparison necessarily lies only in the field of serious and well-defined complaints; much more work is necessary on other illnesses. These statistics of priority allowances were kept by the Ministry of Food at the request of the Food Rationing (Special Diets) Advisory Committee of the Medical Research Council. The diseases upon which Stocks reports are active tuberculosis, gastric, duodenal, and anastomotic ulcers, dyspepsia due to other causes, diabetes mellitus, and thyrotoxicosis; for all of these extra allowances of milk were allotted. At the end of 1947 there were registered in England and Wales just under 100,000 diabetics, or 231 per 100,000 population; 118,000 cases of respiratory tuberculosis, or 278 per 100,000; and nearly 670,000 cases of ulcer or dyspepsia (roughly divided into the ratio of 2 : 1). Allowances for thyrotoxicosis numbered 4,467, or 11 per 100,000 persons—women predominating in the ratio of 3½ : 1. The incidence of this complaint in the northern counties was considerably below that reported in London and the South. In the present report, however, Stocks limits himself almost entirely to the assessment of sickness in the population as a whole. Its measurement in local communities is of more particular interest to many persons—the medical officer of health, for instance—and this, the Registrar-General promises in his preface, is not being overlooked.

AIR TRANSPORT OF THE SICK AND INJURED

The credit of being the first to transport a wounded man by air belongs to a French pilot, Captain Dangelzer, who flew a wounded Serbian airman to safety during the retreat of the Serbian army in 1915.[1] The French were also the first to introduce air ambulances; this was in Morocco in 1918. The Royal Air Force first transported casualties by air in 1919, during the war against the Mad Mullah in Somaliland, when three patients were moved, one at a time, 175 miles on stretchers placed inside the tail-end of the fuselage of a DH9.[2,3] The R.A.F. began to develop air ambulances during the years 1920–2 and put them into use in Iraq in 1923, when 359 patients were transported—198 of them being cases of dysentery among British troops operating in Kurdistan. Even then most of the casualties were taken in troop-carrying aircraft convertible into air ambulances at short notice. The first organized R.A.F. air-ambulance service in this country was based at Halton during 1925 and 1926 and served a radius of 100 miles; it was disbanded in 1927. From that time until the outbreak of the war of 1939–45 the number of Service patients transported each year by air (mainly in the Middle East and India) varied between 66 and 418. In 1937, when the R.A.F. general hospital in Bagdad was moved some 90 miles to Habbaniya, the majority of the patients were transported by air. It was found, however, that to reserve aircraft solely for ambulance purposes was uneconomic, and consequently until the outbreak of hostilities in 1939 troop-carriers were used as air ambulances when required.[3]

At the beginning of the war there was no organized air-ambulance service, but in 1941 a service was established in the Western Desert and another in the United Kingdom for the benefit of the garrisons in the outlying Scottish islands. The air-ambulance service in the Western Desert operated with aircraft provided by the Australian Air Force, the South African Air Force, and the R.A.F., and during the campaigns of Wavell, Auchinleck, and Montgomery about 60,000 patients were moved by air from forward areas to the base. From then onwards the transport of casualties by air in the various theatres of war increased rapidly, so that by V.J. Day the R.A.F. had carried approximately 400,000 sick or wounded patients, most of whom were in the Army. This fine performance

[1] Munro, D., *Proc. R. Soc. Med.*, 1924, **17**, 7.
[2] Armstrong, H. G., *Principles & Practice of Aviation Medicine*, 1943, London, p. 494.
[3] Whittingham, H. E., *Proc. Cardiff med. Soc.*, 1945, 44.
[4] Jackson, R. C., *Lancet*, 1945, **2**, 543.

was carried out without a single mishap, though over 30,000 separate flights were made and much of the flying was done from forward landing strips near the enemy, over jungle, mountains, and sea, and in all conditions of weather. The maximum number of casualties transported in a single day during the Western Desert campaign was 400, and during operations in Normandy 934.[3,4]

The air-ambulance service did much to maintain the high morale of our Forces. The patients selected for transport to appropriate treatment centres were those for whom early treatment was necessary either to secure a successful result or to ensure their early return to duty. Priority was given to patients with facio-maxillary injuries, burns, perforated wounds of the globe of the eye, fractures of the limbs and spine, and head injuries. Patients suffering from certain conditions were not considered suitable for air transport until after appropriate treatment in forward areas: among these conditions were shock, recent abdominal and thoracic wounds, recent severe haemorrhages, gas gangrene, lobar pneumonia, pneumothorax, angina pectoris, and coronary occlusion. Oxygen and blood transfusions were given as required *en route* by specially trained nurses and nursing orderlies. During the war all the helicopters available were needed for operational duties in the field. This type of aircraft can now be safely employed for the transport of casualties back from the most advanced landing strips, and the Royal Air Force is using them to develop a casualty evacuation service. In war, air ambulances have other advantages besides getting the wounded back to a casualty clearing station or hospital in the shortest possible time with the minimum of discomfort; they reduce the numbers of doctors, nurses, and orderlies employed on the evacuation of casualties and they free the lines of communication from road ambulances and ambulance trains.

For civilian sick an air-ambulance service was inaugurated in 1933 by Scottish Airways to serve the isolated Western Isles of Scotland; ordinary passenger planes, based at Renfrew, were used. Patients were taken to hospitals in Glasgow, or doctors and nurses were taken to the patients. In 1935 certain Scottish county councils agreed to bear part of the cost of air ambulances used in cases of emergency. The Department of Health for Scotland now operates this scheme through the regional hospital boards and British European Airways. The number of patients transported each year is about 300. Just before the war began an air-ambulance service was established for the transport of patients from the Channel and Scilly Isles. In 1941 the Air Transport Auxiliary formed an air-ambulance service, using stretcher gear built into passenger-carrying aircraft. The number of aircraft in this service rose to 60, and these carried nearly all the Service sick and wounded who were transported by air within the British Isles.

Mainly as a result of the lessons learned during the war the British Airways Corporations have been able to work out a policy for the benefit of all invalids proposing to travel by air. In a paper appearing elsewhere in this issue the chief medical officers of the three British Airways Corporations—Air Marshal Sir Harold Whittingham, Dr. A. Buchanan Barbour, and Wing Commander J. C. Macgown—give authoritative information about how a patient's fitness for air travel should be assessed. It is interesting to note that in the future most aircraft will be "pressurized"; this means that the majority of invalids will be able to travel by air with as great, if not greater, comfort than by road, rail, or sea.

NATIONAL TRIAL OF B.C.G.

At the London meeting of the International Conference of Physicians in 1947 Professor W. H. Tytler remarked that Great Britain had "the questionable distinction of being the only one of the major countries which has contributed little or nothing to B.C.G. vaccination."[1] According to recent and widespread reports in the daily press it appears that this situation is shortly to be righted, though the announcement of national trials is, we understand, premature and an official statement is not to be expected for another two or three weeks. It is, however, known that early last year the Ministry of Health set up a distinguished committee to advise it on the nature and scope of the trials of this vaccine, and the details of this committee's conclusions will be awaited with great interest. According to the parliamentary correspondent of *The Times*[2] volunteers are to be sought among nurses and medical students and among young persons in contact with tuberculous patients in their homes.

Nurses, of course, have long been considered a group in need of special protection, and it is certain, therefore, that they would be brought into any trial in this country. The difficulty may be to secure enough in numbers, particularly as some hospitals will not be in a position to take part in the experiment at all. For example, there are hospitals which do not allow tuberculin-negative nurses to work in their tuberculosis wards. If the volunteers are to be divided into two groups—those to be vaccinated with B.C.G. and those to be held as controls—then the unvaccinated group in hospitals with such a regulation would not be allowed in contact with cases of tuberculosis and the vaccinated group would be in contact with them. A comparison between groups exposed to such different risks would clearly be of little value. Any effective trial with nurses and medical students requires two groups that will subsequently have a comparable exposure (on the average) arbitrarily divided into the vaccinated and unvaccinated.

Another likely field of inquiry would be young adolescents leaving school and going into factories or offices—particularly, perhaps, young women, in whom the peak of mortality from tuberculosis lies in the early adult age-groups. Here again the inquiry will need to be widespread and to cover many thousands of persons. The attack rate from tuberculosis in this country is such that decisive differences between vaccinated and unvaccinated are not likely to be revealed in any study with small numbers. This line of investigation might well be linked up with the mass-radiography campaign. The volunteers must agree to take part in what is, it must be made clear, a national experiment.

[1] *Lancet*, 1947, **2**, 438.
[2] *The Times*, March 31, 1949.
[3] *British Medical Journal*, 1948, **1**, 274.
[4] Ibid., 1946, **2**, 125.
[5] Ibid., 1948, **1**, 1126.
[6] Ibid., 1948, **1**, 1129.

A third group of great importance comprises babies and young children in homes where there is a case of open tuberculosis. To include these in a controlled trial would be very difficult, for according to the advocates of B.C.G. the child must be removed from the home, proved to be uninfected, and then made tuberculin-positive before return. What of the controls? They too must be removed from the home and proved uninfected; they will not become tuberculin positive, for no vaccine will be given them. Can they be returned to a still infective home, even allowing for doubts about the efficiency of B.C.G.? As Professor Bradford Hill pointed out[3] in this *Journal* last year, such demands may, too, in everyday life "materially reduce the field in which B.C.G. can operate, since it necessitates pre-detection of the tuberculous household and removal of the infant at birth for some months." It may be, therefore, that B.C.G. should be tested under the normal conditions of life without removal of the child from the home. That might not be ideal, but it is realistic.

A fourth group in this country might be found among mental defectives or the mentally deranged in institutions. Such patients have relatively high death rates from tuberculosis and, being in institutions, can easily be followed up after vaccination. The follow-up, indeed, is likely to be one of the major difficulties in this national trial. Very large numbers of persons must, as we have said, be brought into it, and they must be followed up for at least 3–5 years. Uniform tuberculin-testing, uniform *x*-ray photography, and, above all, uniform statistical records of illness and death must be developed and maintained. Uniformity is the paramount issue. Regional hospital boards and local authorities might, as has been suggested in the Press, administer the schemes, but if they are not centrally guided and controlled it is almost certain that the schemes will fail. It would seem wiser, as was indeed suggested in 1946,[4] to place such a difficult but practically important piece of research in the hands of some such official body as the Medical Research Council, which has the necessary field experience of such trials.

Professor Wallgren,[5] of Stockholm, has pleaded that B.C.G. be given a fair trial, and H. Malmros[6] recently described in this *Journal* his experience with it in Sweden. This country now has the opportunity, and will, we trust, make both a fair and a statistically sufficient trial; otherwise we shall merely add to the many reports that collectively provide presumptive but not wholly convincing evidence.

THE BRITISH MEDICAL GUILD

The second of the Special Representative Meetings held last week in B.M.A. House had before it a report of the Council on the constitutional position of the B.M.A., a report drawn up in response to a request by the Representative Body in Cambridge last year that the Council should explore the possibility of setting up a body equivalent to a trade union.

This Report has been published,[1] and comment on it appeared in these columns in the *Journal* of Feb. 26, 1949.

[1] *British Medical Journal Supplement*, 1949, **1**, 95.

The Special Representative Meeting, after an interesting debate, accepted the Council's recommendation

"that for the better protection of the interests of the medical profession in disputes with public authorities and other bodies, a new organization be established in the form of an independent board of trustees with power to organize and finance collective action by the profession and to provide financial compensation to practitioners suffering financial hardship through participation in such collective action."

This new organization, which is to be called "The British Medical Guild," will be constituted in accordance with the Trust Deed drafted by the Association's solicitors. The trustees of the Guild will be members of the B.M.A. Council for the time being. The Guild, in fact, will be a legitimate but not identical twin of the B.M.A., and its policy will be that laid down by the Representative Body. As a separate legal entity it will be able to do those things which by its constitution the B.M.A. is unable to do. It will be, in effect, a Trust Fund supported by voluntary contributions, and the trustees will be able to use the money thus collected as a financial weapon in disputes and as a source of compensation for medical men who may suffer financial loss as a result of taking action advised by the Guild. The Guild will not have a separate membership but will be organized centrally and locally in much the same way as was the Independence Fund set up last year. If the Association's armoury is to be well stocked it is essential that those members of the profession other than general practitioners should subscribe to this Fund so that in an emergency it can indeed be effective. The general practitioners under N.H.I. have for years had their own Defence Trust and continue to subscribe to it in the present National Health Service. This Fund is under the control of trustees who are members of the General Medical Services Committee, and no doubt the trustees will consider the question of making a contribution from its Fund to the Trust Fund under the British Medical Guild.

Although the Representative Meeting passed the Council's motion by a very large majority many doubts were expressed about the wisdom of the course in a series of excellent speeches. The representative of the Lothians Division ably supported an amendment to the effect that the Association as at present constituted was competent to undertake any necessary negotiations on behalf of the profession. The B.M.A., he believed, stood as one of the greatest democratic institutions of this country, and the fact that it could not coerce its members in times of difficulty was a source of strength to it. Another speaker considered that the proposed Guild was as near to a trade union as the Council could desire without incurring legal difficulties, and it was obvious from the discussion on motions advocating the formation of a trade union that this was something the Representative Body did not want. One speaker drew attention to the fact that the B.M.A. had approved using the Whitley machinery for negotiations on the remuneration of the profession. If negotiation breaks down, then the matter would be submitted to arbitration. If two parties submit a matter to arbitration it is assumed that they agree in advance to accept the decision of

the arbitrators, and from this the conclusion would seem to follow that the Trust Fund would not be used to resist such a decision. Dr. H. Guy Dain, the Chairman of Council, however, pointed out that the Whitley machinery covered only certain aspects of the contract between various sections of the medical profession and those who pay them. Attaching his remarks closely to the motion submitted by the Council, Dr. Dain gave cogent reasons for the establishment of a British Medical Guild, and when the three propositions of the Council's motion were put to the Meeting each one was passed by more than the necessary two-thirds majority. It now remains for the medical profession to back up the policy approved by the Representative Body and to subscribe to the Fund when the proposed methods of doing this are made public.

The constitution of the B.M.A. has been moulded in response to the new situation in which the medical profession has found itself since July of last year. Some aspects of this were commented on at the Special Representative Meeting which considered the question of remuneration of general practitioners. The General Medical Services Committee, while a Committee of the B.M.A., is nevertheless autonomous, and, acting for the general practitioners in the N.H.S., submitted to the Ministry of Health the case for an increased betterment factor. The Consultants and Specialists Committee of the Association is also autonomous. At first glance it would seem that these two autonomous bodies might detract from the authority of the Representative Body as the policy-making organ of the B.M.A. For years the Insurance Acts Committee was similarly an autonomous body and yet there was never any point of conflict between it and the Representative Body. So on the basis of this experience there would seem to be no reason to expect marked divergence of views and actions between the two new autonomous committees and the Representative Body. Nevertheless, the situation is to some extent changed by the fact that a large majority of the medical profession is now working under the National Health Service Act, and the Representative Body will watch the evolution of these two new committees with interest and sympathy. No doubt as time goes on their motives, decisions, and actions will become more and more closely interlocked, and the Representative Body will be eager to lend its powerful support to the actions of any one section of the profession whether general practitioners, consultants and specialists, or those working in the Public Health Service. And for all these groups there will be the economic instrument provided by the British Medical Guild, legally separate from, but closely parallel to, the British Medical Association.

REMUNERATION OF GENERAL PRACTITIONERS

The Special Representative Meeting to consider the remuneration of general practitioners under the National Health Service Act met in B.M.A. House last week and had presented to it the Report of the General Medical Services Committee which had been accepted by the Conference of Local Medical Committees on March 12. Dr. S. Wand, Chairman of the G.M.S. Committee, moved that the S.R.M. should give its fullest support to the Conference of Local Medical Committees in its request to the Ministry of Health that the betterment factor of 70% should be applied to the gross remuneration of general practitioners. Dr. Wand stressed three points: (1) that the betterment of 34% applied to gross remuneration by the Government bore no relation to the present-day value of money; (2) that there were now two or three thousand more doctors in the Service than the 17,900 on which the Spens recommendations were based; and (3) that there were errors in distribution. He stressed that general practitioners had, under harassing conditions and working unreasonable hours, carried out their part of the contract, and asked whether the Minister of Health had carried out his. This dissatisfaction with the Minister's attitude was again expressed later on in the Meeting in the form of a rider moved by the Chairman of Council to the effect that the Representative Body expressed its great concern that the Minister, having received the general practitioners' representations more than two months ago, had not yet made the necessary adjustments to implement the Spens recommendations so that the increased payments could be made in this quarter. "This delay shows disregard for the serious hardship now being experienced by many general practitioners in the Service and is seriously prejudicing its success."

Several speakers urged that the betterment factor should be 85%, thus tying it to the expert's estimate of the increased cost of living for the professional and middle classes. The Meeting, however, was evidently convinced by the arguments put against this by other speakers, not the least of which was that the medical profession should not expect immunity from the consequences of the country's present financial position. The amendment to press for a betterment factor of 85% was lost by a large majority.

There was again discussion on how the increase to the Pool should be distributed, and the S.R.M. finally accepted the recommendation that it should be used to increase the capitation fee of the first 1,000 on a doctor's list. More was heard about the question of restricting the numbers on a doctor's list below the present maximum of 4,000. In a discussion on this the Meeting was once more brought up against the fact that the limitation of a list to, say, between 2,000 and 3,000 would interfere with the free choice of doctor by patients; once this interference is made, a first step will be taken towards the introduction of a whole-time salaried service. Several rural practitioners enlivened the debate by vigorous first-hand accounts of their own experiences, and made it clear why there has not been more overt approval of the Association's success in obtaining half a million pounds of new money for the Mileage Fund. It seems as though this has not sufficiently relieved the position of many practitioners in rural areas; at the same time, if the betterment factor now being asked for is obtained and is applied to the first 1,000 on a doctor's list, rural practitioners should be among the first to benefit, as from the nature of their work the numbers of patients on their lists cannot be large.

Although the Meeting had to go over the same ground already covered by the General Medical Services Committee and the Conference of Local Medical Committees, new facts were brought to light, fresh emphasis was given to familiar aspects of the same problem, and, what is perhaps more important, the S.R.M. with representatives from all branches of the profession gave its solid backing to the case already made by the G.M.S. Committee on behalf of general practitioners working in the National Health Service. It is to be hoped that the Minister of Health will not delay much longer in making known to the medical profession his decision, and that of the Treasury, on the betterment factor to be applied to the remuneration of general practitioners.

TEMPORAL ARTERITIS

In 1890 Jonathan Hutchinson[1] described the case of a man of 80, father of a London Hospital beadle, who found wearing his hat painful. Painful and swollen temporal arteries accounted for his symptoms, which in due course disappeared. Forty years passed before Schmidt[2] described a similar case; and in 1932 workers at the Mayo Clinic, unaware of previous cases, described the apparently new disease "temporal arteritis." This disease has recently been the subject of two critical reviews, one by Harrison[3] in this country, and the other by Protas and Saidman[4] in the U.S.A. The British author has discovered 75 cases in the literature compared with the Americans' 34. The number of recorded cases is probably mounting rapidly; neither of the papers referred to includes the four cases recently reported by Jennings[5] in this *Journal*. The disease is obviously rare, though, since it was not properly recognized until 1932, it has only a few years' history. Cases in the U.S.A. and Great Britain comprise the recorded majority; there have been, however, reports from the European continent. It is, like many another rare condition, a disorder which accumulates around medical teaching centres. In certain respects it is a clear-cut entity: it is a disease of senility in both sexes, for nearly all the cases are aged 60 or over; it runs a six months' course; all the cranial arteries may be affected, and indeed many large arteries elsewhere in the body; blindness due to retinal ischaemia from involvement of vessels behind the globe is found in one-third of the cases; and death from cerebral haemorrhage often occurs. The histological appearances are typical: the medial arterial coat is infiltrated with lymphocytes, plasma cells, and, outstandingly, giant cells, from which one name of the disorder is derived.

The questions which might reasonably be asked about this condition include whether it is really a separate entity, how it differs from polyarteritis nodosa, and whether it has been correlated with rheumatic conditions (some patients with temporal arteritis have been arthritic, but at their age they might well be). It would also be relevant to inquire what comprises a clinical entity. A syndrome has been defined as a disorder with three symptoms and not less than three recorded cases; and temporal arteritis fully satisfies these criteria. But there is little to show that it is not polyarteritis in an older age group. Classical polyarteritis is a disease of men more than of women, and the age of the patients is usually between 25 and 45. Eosinophilia and albuminuria are often present, and neither is seen in temporal arteritis. Finally, the histology differs, as does the prognosis: the majority of patients with polyarteritis die. Jennings considers that temporal arteritis is part of a generalized arteritis in old people, and experienced histologists to-day recognize widespread arterial disease, affecting arteries of medium size and arterioles, far more frequently than in the past. Many allergic conditions fall in this group, and it would be premature to accept "temporal arteritis" with certainty as a distinct entity, though it has passed the acid tests of being described by a British physician, being forgotten, and being redescribed and annotated in the U.S.A.

1 *Arch. Surg., London*, 1890, **1**, 323.
2 *Brain*, 1930, **53**, 489.
3 *J. clin. Path.*, 1948, **1**, 197.
4 *Med. Ann. Distr. Columbia*, 1948, **17**, 34.
5 *British Medical Journal*, 1948, **1**, 443.

HORMONES AND ENZYMES

Underlying the physiological changes brought about by hormones are biochemical changes, and the mode of action of hormones will remain obscure until more is known about how they modify biochemical processes. Some recent experiments have shown that the amount of an enzyme called by Mendel pseudocholinesterase in different tissues is altered by the action of hormones. If this enzyme plays some part in ordinary metabolism the amount present would be expected to be the same in both sexes, but in 1940 Birkhäuser and Zeller[1] showed that the livers of female rats contained three to five times more than the livers of male rats. Pseudocholinesterase differs from the cholinesterase present in the central nervous system, which is known as true cholinesterase and which is almost certainly concerned with the hydrolysis of acetylcholine. Though pseudocholinesterase is able to hydrolyse acetylcholine, this is not likely to be its function, which still remains undiscovered.

Poisoning with carbon tetrachloride reduces the amount of pseudocholinesterase in the livers of rats, and similarly in liver diseases the amount is low. The enzyme is also present in serum or plasma, and there it is associated with the albumin. Administration of oestrogens augments both serum cholinesterase and serum albumin. From these several observations it seems clear that pseudocholinesterase is produced in the liver[2] and is present in the blood. Sawyer and Everett[3] have shown that after castration the plasma pseudocholinesterase in the female rat falls to 40% of its initial value, while in the male it rises to 50% above its initial value. When pellets of oestradiol are implanted in the female the amount of pseudocholinesterase in the plasma is trebled, and when testosterone is injected into male rats the amount is halved. Recently Hawkins, Nishikawara, and Mendel[4] have shown that after thyroidectomy the amount of pseudocholinesterase in the plasma of rats rises from a normal value of 41 to 97. If thiouracil (which prevents the formation of thyroxine by the thyroid gland) is given to rats the pseudocholinesterase value rises to 117. On the other hand, when healthy rats are given thyroxine the pseudocholinesterase value falls below normal to 28. No similar changes were found in true cholinesterase values in any of these experiments. The biochemical process in which pseudocholinesterase takes part must be one which is greatly augmented or reduced in intensity by the circulating hormones, and the interesting observations already made will stimulate further search for the function of this enzyme. The conception that hormones act at least in part by modifying the production of enzymes in the liver is a new one, and further examples of this action are likely to be heard of soon.

1 *Helv. chim. Acta*, 1940, **23**, 1460.
2 *Endocrinology*, 1946, **39**, 307.
3 *Amer. J. Physiol.*, 1947, **148**, 675.
4 *Endocrinology*, 1948, **43**, 167.

TUBERCULOUS MENINGITIS TREATED WITH STREPTOMYCIN

Experience in Scotland

The interim report of the Streptomycin Subcommittee* of the Scottish Scientific Advisory Committee describes how 81 cases of tuberculous meningitis were treated at the five Scottish streptomycin centres between September, 1947, and May 31, 1948. The results of treatment were assessed after a minimum survival period of four months (122 days) from the date of admission. The diagnosis of tuberculous meningitis was confirmed by isolation of the tubercle bacillus from the cerebrospinal fluid in 77 cases, in 75 of them during life and in two at necropsy. The remaining four cases, not bacteriologically proved, have been included in view of the very strong presumptive evidence of the disease. The series includes a number of patients who developed clinical signs of meningitis while undergoing streptomycin treatment for miliary tuberculosis. Such an occurrence might indicate that a "silent" involvement of the meninges had been part of the original miliary spread.

Results of Treatment after a Minimum of Four Months' Observation and Treatment in those who Survived

Age on Admission	Total Admissions up to May 31, 1948	Condition on Sept. 30, 1948		
		Dead	Stationary Relapsed Deteriorating	Progressing Favourably
Under 4 years ..	21 (100%)	13 (62%)	3 (14%)	5 (24%)
4–17 years	36 (100%)	14 (39%)	1 (3%)	21 (58%)
Over 17 years ..	24 (100%)	18 (75%)	1 (4%)	5 (21%)
Total ..	81 (100%)	45 (56%)	5 (6%)	31 (38%)

The following classification was used in assessing the clinical state: *Early.*—Minimal physical signs; no neurological signs; not badly confused. *Intermediate.*—Definite meningeal and neurological signs present; confused but able to be roused. *Late.*—In coma; many neurological signs.

Results According to Clinical Condition on Admission

Clinical Condition on Admission	Total Admissions up to May 31, 1948	Condition on Sept. 30, 1948		
		Dead	Stationary Relapsed Deteriorating	Progressing Favourably
Early	21 (100%)	7 (33%)	3 (14%)	11 (53%)
Intermediate ..	44 (100%)	24 (54%)	2 (5%)	18 (41%)
Late	16 (100%)	14 (88%)	0	2 (12%)
Total ..	81 (100%)	45 (56%)	5 (6%)	31 (38%)

Treatment

In this series no case of meningitis responded for any length of time to intramuscular streptomycin alone, and in common with other workers it was agreed that all cases require streptomycin by both the intramuscular and the intrathecal routes.

Intramuscular Therapy.—The daily dose of streptomycin used intramuscularly was 1.5 to 2.0 g. for adults and 20 mg. per pound body weight for infants and children. At the beginning of the trial this amount was given in four doses at six-hourly intervals, but later the interval was lengthened to 12 hours. This lengthened interval seemed to be equally effective, since at the end of 12 hours the blood level of streptomycin was generally above 0.5 μg. per 100 ml., which was regarded as adequate. Intramuscular injections were usually continued for a period of three months and sometimes longer.

Intrathecal Therapy.—The scheme of dosage for intrathecal streptomycin varied more than that for intramuscular therapy. The one most frequently used was a daily intrathecal injection of 100 mg. for two or three weeks. This was given continuously or on alternate weeks with a rest period intervening; in other cases injections were given on alternate days. For children under the age of 12 the dose was sometimes reduced to 50 mg. and for those under the age of 3 years to 25 mg. At the end of the initial intensive therapy streptomycin was injected into the theca whenever the cerebrospinal fluid was removed for examination. This was usually done once a week for several months.

The toxic signs observed, roughly in order of their frequency, were fever, vertigo, rashes, vomiting, deafness, and nephritis. The minimum period of observation was seven months in 52 of these patients; 20 (38%) have survived, and 17 (33%) of them are progressing favourably.

The report concludes by pointing out that the results at present are impressive for a disease which formerly was universally fatal, but final conclusions in regard to the real rate of cure must await an extended period of observation.

*Professor D. M. Dunlop was chairman of this committee, and the other members were Professors J. W. S. Blacklock, C. Cameron, S. Graham, and G. L. Montgomery, with Drs. T. Anderson, D. Bell, D. G. McIntosh, and J. D. Ross. Dr. I. M. Macgregor was medical secretary and Mr. G. Robertson secretary.

MENTAL HEALTH WORKERS IN CONFERENCE

FIRST EXPERIENCES OF NEW LEGISLATION

A conference on mental health was held on March 17 and 18 in London and attended by delegates from local health and education authorities in all parts of the country and by representatives of voluntary agencies. The summoning body was the National Association for Mental Health, whose patron, the Duchess of Kent, formally opened the conference, at which first experiences of the recent social legislation and its implications for mental health were discussed.

Sir WILSON JAMESON, Chief Medical Officer of the Ministries of Health and Education, in an introductory address, spoke of the continuing value of voluntary organizations, able and willing to experiment and to indicate ways in which the official services could profitably develop. He begged mental health workers to address themselves to measures which seemed likely to cut down admissions to hospitals or to shorten stay. He looked forward to a closer liaison and interchange of staff between general and mental hospitals.

Dr. J. R. REES, who was president of the International Congress on Mental Health held last August, said that recommendations formulated by the Congress had been sent to the appropriate United Nations agencies, especially the World Health Organization, whose executive at its recent meeting had adopted a very large number of them and was proposing a considerable budget—about a million dollars—for mental health work next year. These recommendations had to be endorsed by the World Health Assembly to be held in Rome in June. This progress was the more noteworthy because a large proportion of the members of the executive of WHO were public health men, and this was the first occasion on which, in international public health work at any rate, more than lip service had been paid to mental health.

The State and the Individual

The discussion on the effect in particular of the National Health Service Act was opened by Professor D. R. MACCALMAN Nuffield Professor of Psychiatry in the University of Leeds The official attitude towards mental health, he said, was still over-anxious about care and control, especially the control of persons of unsound mind. Clinics for the treatment of neurosis were too much burdened with minimizing the nuisance factor to society of the maladjusted, and child guidance was most frequently concerned with behaviour problems, many of which could have been prevented by reasonably good upbringing and imaginative education. As one who had approached the National Health Service Act with caution and even scepticism, he acknowledged that the more he had seen of its working—as a member of a regional hospital board and for a short time as a member of an advisory committee in another region—the more gratitude and admiration he felt for its architects. The danger was that the Act might be so interpreted and administered that emphasis would be placed here again on methods of care and treatment rather than on the investigation of fundamental causes. For research under the National Health Service "money should be poured out like water." It was the one field in which they should never economize. He also stressed the harm which might result from

the State doing too much for the individual. The child whose parents lavished on him anxious and indulgent care grew up unattractive and unbalanced in character, and there was some danger of a too benevolent and over-protective Government devitalizing its citizens.

These remarks brought to the platform Dr. H. B. MORGAN, M.P., who said that in former days too much was done for certain spoiled citizens in privileged positions in order that they might acquire wealth at the expense of the community. The object of the Health Act and the National Assistance and Insurance Acts was to set up a standard below which the ordinary citizen should not be allowed to fall.

Dr. R. SESSIONS HODGE said that the research for which Professor MacCalman had pleaded was not necessarily a question of big battalions; some of the best research work had been done by individuals and small units. He suggested a system of clinical assistantships whereby men in general practice who had the right temperament and personality might in their local areas work in association with those engaged in psychiatry. Dr. J. STEVENSON LOGAN deplored the attitude of some sections of the medical profession towards institutionalism. They did not fully apprehend what the mental hospitals could now offer, and were not disposed to play their part in securing mental hospital treatment for their patients.

Psychiatric Social Workers

Miss MARJORIE BROWN, psychiatric social worker in the Department of Psychological Medicine, University of Durham, said that psychiatric social workers now numbered 330. About one-third worked in mental and general hospitals and clinics, one-third in child-guidance services, and one-third in other forms of mental health work. About 50 students were trained each year. She thought that local health authority psychiatric out-patient clinics, which were points of contact between the regional board and the local health authority, should be a decisive force in the mental hygiene of the future. Only a few of these clinics had been established so far, and there were a large number of unfilled posts, most of them in adult work—a number which, owing to the demands of the Act, was increasing. The shortage was partly due to the general lack of social workers, but also to competition with other more attractive forms of social work and training courses.

Dr. WYNDHAM DAVIES mentioned the difficulty in obtaining mental health staff, particularly in counties like Cornwall. They were now reduced to bargaining for candidates and had to compete with the demands for social workers in other fields. Even worse, the National Association for Mental Health had had to close down some of its regional organizations which had been of very great value in recent years. (It was explained that this closing down of the National Association's activities was in no way a voluntary withdrawal, and that the Association had protested and pleaded in vain against such closure.) The result was that those at the periphery were left to their own resources. Voluntary associations, of course, were pioneer bodies and sooner or later must withdraw from the scene, but the time for their withdrawal was not yet.

Many good points were made by lay speakers in this discussion. One parent referred rather resentfully to the health worker who, after her week-end leave—parents did not get week-end leave—called on Monday morning at the home and talked in a rather superior way to the overburdened mother. This speaker suggested the recruitment of social workers from "postgraduate mothers"—mothers whose children were off their hands, and who could get down to "kitchen-sink level" with the women they visited.

Art of Consultation

The second day of the Conference was devoted to a widely ranging discussion on the need for understanding of the individual as part of the training and function of doctors, nurses, and teachers. Professor J. C. SPENCE, Professor of Child Health, University of Durham, said that the doctor needed to have a basic, expert, and specialized understanding of the individual if he was to work with success.

"The real work of a doctor is only faintly realized by many lay people, and I am more disposed to say this now that we see how ill designed are some of the plans for its conduct. It is not an affair of health centres or public clinics or operating-theatres or hospital beds. These techniques have their place in medicine, but they are not medicine. The essential unit of medical practice is the occasion when, in the intimacy of the consulting-room or sick-room, a person who is ill, or believes himself to be ill, seeks the advice of a doctor whom he trusts. This is a consultation, and all else in the practice of medicine derives from it. The purpose of a consultation is that the doctor, having gathered his evidence, shall give explanation and advice. . . . The explanation is pursued further with what the Greeks call *pronoia*, which is something more than prognosis. It is knowing all about a person without being told. With this the doctor uses his understanding of the individual and of his disease to prepare him and his near relatives for the hospital, for the technical treatment in the hospital, and for his life after hospital. It is not difficult to realize something of the intimacy, the courtesy, and the understanding which are required in this work."

Some doctors, Professor Spence continued, did not like this way of medicine. They were more interested in things than in people, and would find their places in the laboratory field or in technical therapeutics. The art of consultation was best practised in out-patient departments. In his own hospital consultations were given by the most experienced members of the staff. Two or three students were allowed to watch and listen with as much self-effacement as possible. The students were told that before explanation and advice could be given to a patient they must make three diagnoses—namely, of the disease, of the concept of the disease in the mind of the patient, and of the patient's capacity to understand the explanation and follow the advice. With this preliminary explanation students were quick to see the significance of consultation, and some of them confessed that through these experiences they realized for the first time what the practice of medicine meant.

Professor BRIAN STANLEY, Director of the Institute of Education, University of Durham, followed on the same lines from the point of view of the teacher, and Miss MAY IRVINE, tutor for psychiatric social work at Manchester University, from that of the social worker. Miss OPIE, of King's College Hospital, remarked that in spite of the shortcomings of the nursing profession they did try hard in their educational system to lay emphasis on the importance of the individual. In two big London hospitals at any rate the nurses were told to give welcome and reassurance. Nurses found that it was easy to be patient with the patient, but less easy with the patient's relatives.

Dr. SAWLE THOMAS, speaking as psychiatrist to a regional board, pleaded for an understanding of the doctor by those who were responsible for hospital administration. Most, if not all, doctors who had achieved positions in administration had graduated through years of clinical work, and might be expected to have sympathy and respect for the clinician; but this was not always evident, because the doctor who went in for administration was perhaps overweighted on the side of tidiness, or, it might be, had surrendered to the temptations attached to a position of authority. In some of the mental hospitals under the old dispensation the staffs were so frustrated that all initiative was killed. Autocratic local authorities, too, had failed to allow for freedom in carrying out new ideas. In working with the National Health Service, however, his experience was that these dangers had been avoided. The regional hospital board had delegated its power to management committees, and they in their turn to house and advisory committees, and in this way all groups had an opportunity of expressing their views and putting forward plans which were assured of sympathetic consideration.

Child Care

Much was heard during the Conference on the subject of child care. Miss P. ARMSTRONG, children's officer of the East Suffolk County Council, spoke of some of the difficulties in obtaining foster homes, and startled the assembly with her description of some dubious private schools catering for parents (her script said of the wealthy classes, but in reading it she altered it to the middle classes) who desired to conceal and be relieved of their unwanted children. Dr. LESLIE HOUSDEN referred to the increase in juvenile delinquency, and suggested that it was impossible to change the mental attitude of parents on a scale wide enough to affect the sum total of mental

ill-health in the country, and that the only practicable step was to concentrate on the younger generation. Dr. C. O. STALLYBRASS spoke of the need for the nurture and protection of home life. Unhappy marriages brought a heavy penalty to the partners, but a heavier penalty to the children.

Finally, Dr. T. C. GRAVES mentioned the physical factor in mental illness. He described the case of a schoolboy aged 16 whose mental disturbance was at first ascribed to over-study, but afterwards he was diagnosed as a schizophrenic and treated accordingly. Eventually on physical examination he was found to have infective conditions of the nose and throat, with gross impaction of wisdom teeth. Within a month of these conditions being attended to he had recovered, and his recovery had been sustained over a period of fifteen years. Dr. Graves pleaded strongly for an integrated medicine.

The chairmen at the successive sessions were the Rt. Hon. R. A. BUTLER, M.P., Professor A. N. SHIMMIN, of the University of Leeds, and Dr. G. B. JEFFERY, director of the University of London Institute of Education.

SOCIAL MEDICINE

Rockefeller Foundation Director's Address

Dr. John B. Grant, the Director for Europe of the International Health Division, Rockefeller Foundation, addressed the annual meeting of the Institute of Almoners on March 25. The chair was taken by Professor Alan Moncrieff.

Medicine in all western countries, said Dr. Grant, was moving from the individual to the family as the unit. In a sense men like Pasteur and Koch had retarded medical development for half a century by increasing interest in the minutiae of scientific medicine. Only now were we emerging into the broader conception. Social welfare legislation was a comparatively new thing. The first country to introduce family allowances was Belgium in 1930, and in the succeeding 20 years 30 countries had legislated in that direction. Two forces had been responsible for the new pattern of health and social welfare legislation—political forces and advances in scientific knowledge.

Five non-medical measures were necessary for providing adequate health care: (1) legislation for social welfare other than medical care, with particular reference to family allowances, training of the disabled, maternity benefit, and home helps; (2) a housing policy based on population needs rather than rental values; (3) a national food policy; (4) provision for mental, social, and physical recreation through community centres; and (5) educational measures for the development of "health-consciousness." To these must be added three medical measures: (1) removal of economic barriers to health care; (2) provision of sufficient health personnel properly distributed; and (3) a high degree of technical excellence in both personnel and equipment.

The eventual quality of health care in any community, Dr. Grant went on, would be determined at the level of the health community centre—not at the hospital. He did not think it was enough to have a health centre as projected in the British National Health Service. It must be tied up with a community centre. Unfortunately health centres had not reached a satisfactory stage experimentally anywhere in the world. The first country to investigate what a health centre might be was Great Britain—in the report of the late Lord Dawson of Penn, published in 1920. He believed that that report would increasingly be the corner-stone of all health services, whether in England, the United States, or Soviet Russia; yet in 1949 there was not one example of such a health centre in England.

The rapid development of medical technology had brought into existence an army of what he called "para-medical workers." Legislation would not provide adequate medical care until these para-medical workers were available in sufficient numbers and their training and supervision were well organized. He travelled all over the world in 1945–7 and found every country bringing out White Papers, but the only country he went to where anybody had got down to the subject and said, "Maybe we will require such and such a number of workers," was Australia.

Group Practice

Dr. Grant believed that in future the medical practitioner would find it increasingly to his advantage to practise in a group at a centre where he would be provided with all the necessary tools. At present the general practitioner concentrated on the relief of pain and the re-establishment of organic function. His responsibility in the future would be to re-establish the functional capacity of the patient in expectation of his return to his community as a socially useful person. The family rather than the individual would be the unit of practice. There would be unification of health care in one continuous programme from cradle to grave. Teams would be captained by the general practitioner and supported when required by specialists and institutional facilities. The teams would be responsible not only for diagnosis and treatment but for the provision of measures for the protection of the individual and the family against forces which interfered with the maintenance and development of full mental and physical capacity. Social medicine in the sense in which it was known in England was one hundred years old. Virchow and others in Germany nearly a century ago were doing what Professor Ryle was now doing in this country. The pattern of health services was already clear. Economic barriers to medical care would be removed by insurance or taxation. Distribution of care would be increasingly improved through institutions in regional areas based as far as possible on teaching hospitals integrated with non-teaching hospitals and health centres.

In conclusion Dr. Grant said that a satisfactory level of practice of social medicine would depend to a very large degree upon the availability of adequate numbers of well-trained medical and psychiatric social workers. The immediate problem was to define the relationship of the social worker to other workers in the team providing health care from health community centres.

THE KING'S HEALTH

Long Convalescence

The following bulletin was issued on March 30 from Buckingham Palace:

> The King continues to make good progress after his recent operation. In order to secure the continuation of the natural process of formation of collateral circulation which has been encouraged by the operation, we have advised his Majesty that a prolonged period of convalescence will be necessary.
>
> MAURICE CASSIDY. J. R. LEARMONTH.
> THOMAS DUNHILL. J. PATERSON ROSS.
> HORACE EVANS. JOHN WEIR.

It is understood that this will be the last bulletin to be issued for the time being. Others will be issued should occasion arise, but not regularly.

A CANTERBURY COMMEMORATION

On the afternoon of June 25, the first day of the Canterbury Festival, there is to be a service at the cathedral which will take the form of a commemoration of the science and art of healing. The Dean of Canterbury, Dr. Hewlett Johnson, who presided over a meeting in London at which the arrangements for the commemoration were discussed, explained that the occasion was intended to be not diocesan but national, and indeed world-wide, for representatives of medical services in other countries would be invited to attend. One whom he very much desired to see present would be Dr. Albert Schweitzer. So much was owing to the medical services in every land that the Friends of Canterbury Cathedral wanted to make the service as representative as possible of all branches of medicine and nursing and the sciences allied to them. It was hoped that the procession would include representatives of the Royal Colleges, the universities, and all the services and organizations, such as the British Red Cross and Order of St. John, concerned with the art of healing. Miss Margaret Babington, who is the honorary manager of the Festival, said that the late Archbishop

Lang had left a legacy to the Friends of Canterbury Cathedral to be used for music and furnishings, and it was proposed to ask a well-known musician to compose an anthem for the service. It was hoped that an eminent medical man would read the lesson and another deliver the address. After the service there would be a performance in the chapter-house of Miss Dorothy Sayers's play, "The Zeal of Thy House."

Reports of Societies

TREATMENT OF BREAST CANCER

American Experience

Dr. FRANK ADAIR, of the Memorial Hospital, New York, lectured to the Section of Surgery, Royal Society of Medicine, on March 23 on "Surgery, Radiation, and Hormones in the Treatment of Breast Cancer." He began with an acknowledgment of the value of British work in cancer research.

Experience had shown, said Dr. Adair, that to give a sufficient dose of *x* rays to kill breast cancer, using *x* rays only, was not feasible, owing to the great damage caused to the skin and other tissues. In his work, therefore, *x* rays had come to be used only in inoperable cases. He criticized the employment of radiation to cover inadequate surgery. The value of pre-operative *x*-ray therapy was still in doubt and the results were not easy to assess; there was less doubt about the value of post-operative irradiation. At the Memorial Hospital patients in whom no involvement of the axillary glands could be detected microscopically were treated by surgery alone; when there was such involvement post-operative *x*-ray therapy was undertaken.

The proportion of five-year survivals after radical mastectomy, when the cancer was limited to the breast, was 74% during the period 1934–9 at the Memorial Hospital. During the period 1940–4 it was 82% and there was a corresponding increase in "cures"—cases in which there was no trace of cancer after five years. It was difficult to estimate the value of post-operative irradiation, but he thought it might add 3 to 5% to the survival figure. For any such assessment, of course, they had to depend upon comparisons between different clinics, where the techniques might not be identical.

Turning to hormone therapy, Dr. Adair, after a reference to the work of British investigators on the oestrogens, referred to a study arranged in America by a subcommittee of the Therapeutic Trials Committee. Supplies of androgen and oestrogen had been distributed to about twenty groups of workers who reported periodically. In his own practice he had been much impressed by the occasional response to the injection of testosterone, particularly in cases where there were metastases in bone. Cases of breast cancer treated with testosterone ceased to menstruate for from three to six months, and in those women near the menopause this amenorrhoea might be permanent. Of 21 cases with metastases in bone, 15 showed a significant drop in serum calcium during the first three months' treatment with testosterone. Cases in which there were secondaries in the liver, with jaundice, had cleared up temporarily under testosterone therapy. Large doses of testosterone induced male characteristics, and in that way possibly inhibited further mammary growth. The dosage of testosterone was 100 mg. three times a week, given over an indefinite period. Here he noted that the age ranges of patients who came up for treatment for breast cancer showed two peaks, one at about 45 as the menopause was approached, and the other at about 60, when there began to be no hormones present at all.

A "hormone team" had been organized at his hospital, including clinicians, a chemist and a biochemist, a radiologist, a full-time nurse, and a full-time social worker. The most satisfactory oestrogen was found to be stilboestrol. Under the microscope there appeared to be no difference between mammary cancer destroyed by oestrogens and that destroyed by irradiation. In some cases undergoing prolonged oestrogen therapy no indication of cancer remained. Their experience with oestrogen, however, had not been as striking as with testosterone. Oestrogen therapy in some cases required months before improvement took place. He looked forward to the introduction of new chemical substances having the same beneficial effect as the hormones now in use but without the distressing features which sometimes accompanied them. There were approximately 600 chemical compounds which should be investigated, and the chemists and the endocrinologists must take the lead in this investigation. He believed that the life history of breast cancer had already been profoundly modified and that a further great contribution might be made during the next few years.

There was no discussion following the address, but Sir STANFORD CADE voiced the thanks of the Section.

ABDOMINAL EMERGENCIES

A meeting of the Liverpool Medical Institution was held on Feb. 3, with the president, Professor CHARLES WELLS, in the chair.

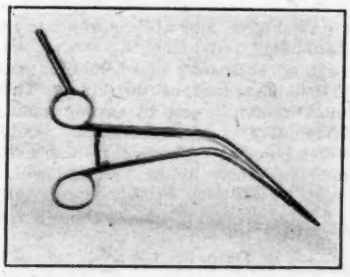
Mr. W. M. BEATTIE read a paper on a consecutive series of 598 emergency abdominal operations, performed at Smithdown Road Hospital by five surgeons during a period of two years. The total mortality was 10.7%. In 347 cases of acute appendicitis the mortality was 2.3% (0.3% in unperforated and 7.6% in perforated cases). Diagnostic mistakes were discussed, and it was pointed out how often patients who had pain in the right iliac fossa only had a normal appendix at operation. The mortality of 19% in 67 cases of perforated peptic ulcer was analysed, and the well-known unfavourable factors of advanced age, delay in operation, associated haematemesis, and a deranged mental state were stressed. Other figures showed that strangulated hernia was a hazard of old age, 60% of the 75 cases occurring in patients over the age of 60 and 35% in patients over the age of 70.

The number of cases of cholecystitis was limited because treatment was conservative whenever possible; the mortality in those who required immediate operation was 62.5%, and the average age of the fatal cases was 75. Three cases of pancreatitis and 8 cases of perforated diverticulitis were also described. At the same meeting Mr. A. MCKIE REID read a short paper on some recent advances in ophthalmology.

Preparations and Appliances

DIATHERMY PRONG FORCEPS

Mr. A. WILFRID ADAMS, M.S., F.R.C.S., writes: This forceps is for use by the surgeon or assistant to seal vessels in subcutaneous and parietal tissues. In the depths, too, thanks to its length, it replaces ligatures of minor vessels, but is to be used warily near vulnerable viscera. The point of bleeding must be displayed and located exactly and the forceps applied with precision. Being angled, the handle does not block the view of the tip, which is specially small to concentrate and



intensify the coagulating current. The instrument acts vicariously as a tenaculum forceps or aids swabbing in deep recesses.

It is, in the main, a combination of Mollinson's tonsil and Hey's diathermy forceps, and I acknowledge my debt to these inventors as well as to Messrs. Down Bros., who make this new type of haemostat.

Correspondence

Cancer of the Breast

SIR,—Animal experiments show that for carcinoma of the breast to develop in the mouse it is necessary that suckling should have taken place from a mother or foster-mother capable of transmitting a virus-like material known as the milk factor. If mice are not so suckled carcinoma of the breast does not develop.

I am anxious to start a long term—very long term—investigation into this matter in the human subject, and for this purpose I wish to collect the names and addresses of female children or adults of whom it is known that they have *never suckled at a human breast*. Family doctors and obstetricians may know of such cases where, because of the death of the mother or for other reasons, it can be *absolutely guaranteed* that the child has never consumed milk from a human source. ("Humanized milk" does not, of course, count.) If, with the permission of the appropriate person, doctors would be kind enough to forward the name, age, and address of such a child or adult, together with the name of her surviving parent or guardian in the case of a child, such an investigation could be put into operation. The card or letter should be addressed to the Secretary of the Mastitis Clinic, Guy's Hospital, London, S.E.1. It is hoped by this means to collect the names and addresses of a large series of females who could not have received the human "milk factor," if such exists, and the investigation would proceed as follows.

On receipt of the name, the child's parent or guardian would receive the following letter:

"Dear ———,

"Dr. ——— has, with your permission, sent me the name of ——— who, he assures me, has not been nursed by her mother or by a foster-mother. Doctors believe now that such children, when they grow up, may be less likely to develop serious disease of the breast than other people, and this possibility you might regard as making up for the lack of what is otherwise the best method of nursing a baby. Nevertheless it is vitally important that this theory should be tested out, and I should be most grateful to you for your co-operation, which might in the future save many lives. All that I shall do is to send you once a year a stamped addressed post-card asking you whether there has been a change of address or whether ——— has now left home. When she grows up and leaves home I or my successor will keep in touch with her in this way, and after explaining to her that we believe that she is *less* likely to suffer from serious breast disease than her friends, ask her whether she will reply year by year on an addressed card as to whether she is still free—as we expect—from any trouble in the breast. It is perhaps only by finding out these things, which as you will appreciate is bound to take many years, that the problem of cancer will eventually be solved.

"If, when ——— grows up, she does not wish to co-operate in this matter she can either ignore the post-card, which, after two years without a reply, will not be sent again, or she can write and tell us not to send her any more, but I hope that she, like you, will feel that by helping in this matter she is really doing her bit, and at such small cost, to alleviate human suffering and advance knowledge.

"Signed ———."

A letter in similar vein, and with appropriate modifications, will be sent to adults.

I, Sir, can see no other way in which this matter, vital to the welfare of the human race, can be settled. That the results of this experiment cannot be seen by anyone reading these lines makes it all the more important that we should start now, and be sure of answering at least one fundamental question about human breast cancer by the year 2030.—I am, etc.,

H. J. B. ATKINS,
Director of Surgery, Guy's Hospital.

London, S.E.1.

Diabetic Coma

SIR,—In your issue of April 2 (p. 565) Drs. Lee, Naidoo, and Torrens compare the treatment of diabetic coma with and without the early administration of glucose, and conclude that treatment with glucose significantly increases the mortality. I cannot agree that their data warrant this conclusion. True, the gross mortality in the group of glucose-treated cases is 40% and in the group of saline-treated cases 11%; but the two groups are not comparable, and when similar cases are abstracted from each group and compared the difference disappears.

It is generally agreed that the prognosis in diabetic coma becomes worse with increasing age of the patient, with increasing depression of the alkali reserve, and with increasing fall of the blood pressure. In the group of glucose-treated patients, 3 out of the 10 cases are over 50 years of age; in the group of saline-treated only 2 out of 18. The average age of the fatal cases in the glucose group is 51 years; in the saline group 32 years. If we exclude the patients over 50 years of age, it is found that the mortality rates in the two groups are the same.

The average value for the alkali reserve on admission of the patients who died in the glucose-treated group is 9.8 vol. CO_2 per 100 ml.; in the saline group 12 vol. per 100 ml. The average value for those who recovered in both groups is 14.8 vol. per 100 ml. In each group there were four patients whose systolic blood pressure on admission was under 100 mm. Hg, and of these one died in each group. In my opinion, therefore, the data provided show no difference between the results of the two treatments.

Nevertheless we should all agree that the results of treatment of diabetic coma, particularly in the elderly, provide no grounds for complacency. That derangements of water and electrolyte metabolism and circulatory collapse are at least potent factors in such deaths is generally recognized, and if any method of treatment can be shown to contribute to these it should be carefully examined from this point of view. It is known that in dehydration much potassium and phosphorus is lost from the body, that these are derived from the cells, and that with their loss intracellular dehydration occurs. When sugar is being removed from the blood either under the influence of extra glucose or insulin—and *a fortiori* when the two influences are combined—a rapid fall of the plasma potassium and phosphorus occurs, and this in depleted patients may lead to serious symptoms. The extent and potential seriousness of potassium and phosphorus deficits and associated disturbances in diabetic coma have been the subject of a recent investigation by Butler *et al.* (*Trans. Ass. Amer. Phys.*, 1947, **60**, 102). If these views are correct, then the rapid correction of the disordered carbohydrate metabolism in diabetic coma may precipitate acute disturbances in the electrolyte balance of a body already depleted. It is perhaps significant that it is only in respect of severe and advanced cases of dehydration in diabetic coma that any suggestion has been made that glucose may have a deleterious influence. But the remedy for this state of affairs is not to abandon a potent weapon—glucose—for the correction of the disordered carbohydrate metabolism, but, as indicated by Butler, to provide the surprisingly large amounts of potassium, phosphorus, and other electrolytes required to remedy the depletion of these substances.—I am, etc.,

H. P. HIMSWORTH.

London, W.C.1.

Height of Hospital Beds

SIR,—As the hospital population grows older, an increasing proportion of my patients fall out of bed or while getting out of bed, blackening their eyes or even breaking their bones. Hospital beds are too high and too mobile for safety and they are commonly placed on well-polished floors. Beds are made high to spare the nurses' backs, but it should not be beyond the wit of man to devise a cheap bed which could be raised to table level for making and lowered to divan level for sleeping.—I am, etc.,

L. J. WITTS.

Oxford.

Tumour Agents

SIR,—I write to ask the following questions because of the views expressed by Professor W. E. Gye (March 26, p. 511). Why is he so sure that the agent of the Rous fowl tumour (and other similar tumours) is a particular virus? What are the exact implications of his remarks in the concluding paragraph on the meaning to be attached to the word "virus"? How exactly (and in detail) does he imagine that the "agent" brings into being the sarcoma cell? Is it by virtue of its possessing a "carcinogenic potency"? How does he explain the rigid specificity of type in the tumours produced? How, in view of this specificity, does it come about that the implantation of a mouse carcinoma (presumably caused by a "specific

virus") into a mouse can nevertheless bring about a sarcomatous transformation of the supporting stroma? And how, especially in view of this last query, does he regard the fact that no such agent or virus has so far been found in epithelial tumours in spite of intense search for such a body?

The reasons for my asking these questions will be found in an article (with references) by myself in the *Edinburgh Medical Journal* (1941, **48**, 305).—I am, etc.,

Aberdeen. J. P. MCGOWAN.

Ankylosing Spondylitis

SIR,—I was sorry to see the suggestion put forward by Dr. C. B. Heald (March 26, p. 546) that it is possible to arrest spondylitis deformans by *x*-ray treatment given early in the course of the disease. I do not believe that this is ever possible, but the patient (if he is already in his thirties when first attacked—an age when the evolution of the condition is usually slow) may have to be kept under observation for several years before recrudescence of symptoms and extension of the physical signs become manifest.

At St. Thomas's Hospital all patients found by me to show clinical signs of subacute sacro-iliac arthritis are treated at once by radiotherapy. This has meant that some cases have completed the course of *x*-ray treatment at a time when no radiological signs of any disorder were yet discernible. Nevertheless, within one to two years the other sacro-iliac joint was attacked and the typical sclerosis had now appeared on the radiograph of the joint first affected.

It is obviously impossible to start treatment earlier than during the clinical and pre-radiological stage of sacro-iliac invasion. Failure to arrest the disease even in such favourable circumstances shows that *x*-ray therapy, however effective it proves in abolishing pain (at times for several years), is palliative, not curative.—I am, etc.,

London, W.1. JAMES CYRIAX.

SIR,—Dr. C. B. Heald (March 26, p. 546) raises several most interesting points. He lays stress on the value of early *x*-ray examination of the sacro-iliac joints and suggests that more frequent early examination of these joints would lead frequently to a much-needed earlier diagnosis in this condition. This is very true. But apart from radiological diagnosis it is amazing how long such patients can suffer, openly and obviously, from ankylosing spondylitis and still escape the notice of the clinician whose eye is only open to diseases of more popular systems.

The most obvious cases are missed frequently in busy out-patient departments even though the complaint that took that patient to hospital may have been directly due to spondylitis. The following history is by no means unusual.

A man, now aged 56 years, suffered his first symptoms while in the trenches in 1916 at the age of 22. He experienced great pain in the buttocks, the right more than the left, which greatly interfered with his walking. Alternating "sciatic" pains and stiffness and pain in the left shoulder further incapacitated him. He received little sympathy and no treatment. The condition worsening, he was finally discharged from the Army as a man of poor moral fibre. From that time on relapse and remission alternated, though the latter never lasted longer than three months at a time. Any change of weather upset him; usually the cold suited him better than the heat. His spine gradually became flexed, his chest sunken, and his abdomen lax and atonic. Feelings "as though bands were pulling tight round the chest" became a major symptom. At no time were peripheral joints affected. He attended hospital several times and was seen in 1947 in a general medical out-patient department of a teaching hospital, where notes read that he was complaining of tight feelings round the chest, that his chest expansion at nipple level was only 1 in. (2.5 cm.), and that he was suffering from bronchitis and emphysema. On Nov. 30, 1948, 32 years after his first symptoms, the correct diagnosis was first made in a case so obvious that it could have been diagnosed across the Horse Guards Parade.

Such a history is not unusual. But no clinician who will not notice the obvious will bother to order a skiagram of the sacro-iliac joints. Ankylosing spondylitis is a condition that is often just not considered in the differential diagnosis of exertional dyspnoea, transient or persistent backache, alternating sciatic pains, sternal pains and tenderness, or even pyrexia of unknown origin. In our ex-Service patients the average time between onset of symptoms and correct diagnosis is 2 years 11 months; in our civilian cases it is nearer three times that figure. Yet few patients give such typical histories or show such obvious physical signs.—I am, etc.,

London, W.1. F. DUDLEY HART.

SIR,—The enthusiasm of your correspondent, Dr. C. B. Heald (March 26, p. 546), for the early diagnosis and *x*-ray treatment of ankylosing spondylitis needs tempering. If he consults the literature of the disease, which comprises some hundreds of papers, he will discover that success was usually claimed in the treatment of early cases before *x*-ray therapy became popular[1–4] He will also find that there is no evidence that deep *x*-ray therapy arrests the disease, though it does appear to relieve the pain, at least temporarily, in most cases.

That the sacro-iliac joints should be studied for early diagnosis has been advocated for at least twenty years.[5 6] Buckley[6] was the first worker in this country to draw attention to the early changes in the sacro-iliac joints. Dr. Heald refers to "this crippling disease" which affects the "most normal healthy physiques." These two ideas were popularized in Gilbert Scott's monograph,[7] which in my opinion contains many other unsubstantiated statements. Only some 10 to 20% of patients seen in general hospital practice can be described as "cripples," and the disease affects people of most diverse physiques.

If we had a cure for the disease and money to spare, Dr. Heald suggested mass miniature radiography of the sacro-iliac joints of young adults might be worth while. As it is, we cannot afford to deal with the far graver matter of pulmonary tuberculosis. Dr. Heald speaks of the *x*-ray changes being "so diagnostically significant." Personally, in studying large films of the sacro-iliac joints of patients' relatives who have suggestive symptoms (such as the pre-spondylitic thigh pains described by Davies-Colley in 1885[8]), using the radiographs of some 40 normal students as controls, I often find it difficult to decide whether the appearances are significant or not.

Finally, Dr. Heald approves of a skin dose of 2,500 r. I doubt whether one is ever justified in irradiating the sacro-iliac joints of a young woman with such a dose unless harmful effects on the ovaries can be avoided with certainty.—I am, etc.,

Bristol. H. F. WEST.

REFERENCES

1 Woldenberg, S. C., *Amer. med. Ass.*, 1924, **82**, 1027.
2 Stockman, R., *Edinb. med. J.*, 1926, **33**, 597.
3 Krebs, W., and Vontz, O., *Dtsch. med. Wschr.*, 1934, **60**, 100.
4 Forestier, J., *Radiology*, 1939, **33**, 389.
5 Bachmann, A., *Fortsch. Röntgenstr.*, 1930, **42**, 500.
6 *British Medical Journal*, 1931, **1**, 1108.
7 *Adolescent spondylitis*, 1942, London.
8 *Trans. path. Soc.*, 1885, **36**, 359.

Obstetrics in Great Britain and Ireland

SIR,—The statement of Dr. Bethel Solomons (March 26, p. 545) "that from an obstetrical point of view we consider that Great Britain and Ireland are one" is so completely at variance with the facts that I cannot let it pass without the strongest protest. As an ex-assistant-master of the National Maternity Hospital, Dublin, I know that the practice of obstetrics in relation to such matters as (1) so-called therapeutic abortion, (2) craniotomy, and (3) sterilization is the direct contrary to that obtaining in many centres in this country. Convinced as I am from the medical point of view—apart altogether from ethics—that such operations are not necessary in the best interests of patients, I feel that the practice of obstetrics in England would be greatly improved by the adoption of the Irish practice in relation to these various matters. However, the point is that these fundamental differences in the practice of obstetrics in England and Ireland do exist, and no one knows this fact better than Dr. Solomons; therefore his statement quoted at the outset of this letter is misleading and gives a wrong impression of obstetrics as practised in Ireland.—I am, etc.,

Sheffield. TIM BOLAND.

Fulminating Meningococcal Septicaemia

SIR,—I was interested in the article by Drs. P. Turner and R. V. Dent on fulminating meningococcal septicaemia (March 26, p. 524), more especially because I recorded findings in a series of 173 cases of meningococcal infection occurring in a recruiting depot in East Africa.[1]

Owing to the fact that we were dealing with African natives we had to rely upon examination of the conjunctivae for the presence of petechiae. Of the whole series, 78 (45%) presented this sign, many of them before meningism supervened. These latter suffered, as Drs. Turner and Dent describe, from collapse associated with rise of temperature and rapid feeble pulse; a number of them also had loose incontinent stools, which was a bad prognostic sign. Penicillin was not yet available, and I was unaware of the value of adrenal cortical extract, but all cases were immediately put on sulphonamide as a routine. There were 25 deaths (14.5%) in all—21 of the patients dying on the day of admission.

The mortality rate threw some light on the value of petechiae as a prognostic sign. The figures for this series were: total number of cases with petechiae 78, deaths 25 (32%); total number where no petechiae were observed (all verified cases by lumbar puncture) 95, deaths *nil*.

It may be of interest to mention that two cases in the series had persistent meningism with turbid C.S.F. for several weeks. Both cases made uneventful recoveries soon after the intravenous injection of T.A.B. (100 million), followed by a 200-million dose two days later.—I am, etc.,

Kirkby-in-Ashfield, Notts. J. D. DURANCE.

REFERENCE

1 *J.R. Army med. Cps*, 1945, **84**, 280.

Fibrositis

SIR,—Surely Dr. J. H. Young (March 19, p. 499) is right. No one need doubt that Stockman and Steinberg demonstrated small areas of polymorphonuclear infiltration in incised fibrous tissue; also no one doubts that Copeman and Ackerman, when dissecting the lumbar muscles of subjects selected at random, really found fatty lobules there. The question is not, Are these findings factual? but, Are they relevant?

It is futile to examine the myofascial tissues for evidence of the cause of the disorder unless previous clinical examination has shown that the fault lies in those tissues. Since clinical examination on accepted lines shows that patients with conditions called "fibrositis" are in fact suffering from articular disorders, examination of the myofascial tissues is pointless. However many little patches of inflammation or fatty lobules may be found, these must not be thought to represent significant deviations from the normal. Still less can they be regarded as in any way causative of the patient's symptoms. Careful clinical examination must point to the structure at fault, which structure should then be examined for the nature of the lesion.—I am, etc.,

Rickmansworth, Herts. M. C. WOODHOUSE.

Whither Tuberculosis?

SIR,—There have been numerous letters in the *Journal* on this subject, but so far the question of its prevention and control does not appear to have been stressed. The real aim of the profession must be the control and prevention of this foul disease.

About 1930 it was definitely shown in the U.S.A. that tuberculosis of bovine origin could be prevented by the eradication of tuberculosis in cattle and the pasteurization of milk. At that time some 2,000 persons, mainly infants, were killed each year by that form of tuberculosis in this country. If the profession had then insisted on the eradication of tuberculous cattle we should not have to-day some 1,500 deaths each year from this form of tuberculosis. Since 1930 only 16% of our herds have been certified free from tuberculosis. To prevent human tuberculosis of bovine origin we must insist on the complete eradication of tuberculous cattle so that there will be *no* living germs of tuberculosis in the milk; and then, if it is considered necessary, pasteurize the milk to make it doubly safe.

For the control and prevention of tuberculosis we must know who has been infected and who has so far escaped infection. This is most necessary, as at 20 years of age 80–85% of our population is said to have been infected. The only way to learn the truth about infection is by the tuberculin test, which is reliable in over 95% of persons tested.

Some really effective chemotherapeutic agent must be found that will kill the tubercle bacillus in the human body, and if used as soon as infection has been discovered, and before it has developed into a case of clinical tuberculosis, we shall be nearer our aim of controlling this disease.

Those persons who are still found to be free from infection urgently need protection, and B.C.G. should be made available for these cases. These two methods would save the spending of hundreds of millions on our sanatoria.

The public should be given the following information about our sanatoria: (1) How many beds were available in 1948. (2) How many patients were treated in those beds during 1948. (3) How many of these patients were discharged in 1948 with the disease "arrested." Has any record been kept of the fate of these "arrested" cases after their discharge, and, if so, with what result? (4) Were any patients discharged in 1948 with the disease definitely "cured"? If so, how many have been cured? (5) What was the cost of this sanatorium service in 1948?

The publication of the above facts would show the value of this sanatorium service and raise the question, Can we to-day afford it?—I am, etc.,

Itchingfield, Sussex. SYDNEY GORDON TIPPETT.

Trilene as an Analgesic in Labour

SIR,—With the recent focus both in Parliament and in the Press on analgesia in childbirth, I think that the lay public should have a note of warning sounded in their ears. The hysteria among the members of committees, both male and female, is almost akin to that aroused by the word "vivisection."

Gas-and-air analgesia is extremely safe, is employed in my unit, and its use taught to midwives. On the other hand, the indiscriminate use of inhalation analgesia with the less safe "trilene" is not unattended by risk. In the last six months I have had cognizance of two maternal deaths in which trilene has been used—in one case as an anaesthetic and in the other as an analgesic.

There has been considerable correspondence recently expressing the view that trilene should be used by midwives in the same way as the Minnitt apparatus. I feel that the findings of the committee who made a recent report for the Royal College of Obstetricians and Gynaecologists should be viewed with considerable respect. These are the deliberations of intelligent and senior men, and, while the gas-and-air apparatus is the safest form of inhalation analgesia, I feel that the indiscriminate use of trilene, both as an analgesic and as an anaesthetic in domiciliary midwifery and minor surgery, should be very seriously investigated.

It is not unknown for practitioners to give one of these self-administering apparatuses to a patient and leave her with it, entirely alone—an extremely dangerous practice. Finally, to stress the danger of trilene, I have knowledge of four cases within the last twelve months in which death has been associated with trilene as an anaesthetic.—I am, etc.,

Irvine, Ayrshire. RICHARD DE SOLDENHOFF.

Pain in Childbirth

SIR,—I was very interested to read the report of the Medical Women's Federation on "Pain in Childbirth" (*Journal*, Feb. 26, p. 333). As a woman doctor with two small children I have had the interesting experience of having had the first in England in 1946 and the second in 1948 in America, where analgesics in childbirth are more extensively used.

Having given a good deal of time and thought to the problem of muscle control and relaxation I approached my first confinement with an open mind. The labour, however, proved to be excessively painful, and little relief was obtained from either pethidine or nitrous oxide, though "trilene" inhalations did give a measure of relief.

In comparison, the second confinement was a pleasure. Four hours after labour started I had a dose of barbiturates sufficient to cause me to doze almost painlessly through the second and third stages. The infant was born healthy and strong, and

was unaffected by the drugs. I was well and got up two days later.

You suggest that the reactions of the medical mothers may have been abnormal. I do not think so. With their knowledge one would expect them to have a more normal approach to labour than women who have not studied its mechanism. A number of non-medical women have said how painful their labours have been and how little relief has been given.

Let it be recognized that for the majority of women labour is painful, if not an agony, and, unless there be contra-indications, the benefits of science should be given to those who wish it.—I am, etc.,

Farnham Royal, Bucks. MARY HERFORD.

Marriage Neurosis

SIR,—It must be in the experience of other psychotherapists as well as myself to discover in the course of analysis that they are treating the wrong member of a married couple. The one who has been sent for treatment proves to be a more stable and worth-while personality than the one who remains aloof. Such a state of things might well be called the marriage neurosis, although the patient readily falls into the category of one or other of the anxiety states.

I think it worth while to call attention to this, since it is easily overlooked if any short cut in therapy is being attempted. The patient, almost always a woman, is extremely likely to make mental reservations when asked to talk of everything which comes into her head, and, since so much material relevant to her anxiety or guilt complex is produced, it may be easy to take at its face value her assertion that all is well with her marriage. A few illustrative cases will make my meaning clear :

A woman was sent for treatment because she had attempted suicide. Her husband refused to come and discuss the situation, and she took all the blame on herself for domestic incompatibility. A few months later he blatantly paraded another woman, and in many ways showed himself to be almost totally devoid of moral responsibility. In another case the woman had an obsessional fear of harming her children. It became apparent that in addition to the usual determinants she had a husband who, although a "decent chap," was decidedly immature and emotionally a drain on her. Another case was a woman who had been driven all her life by an intolerant super-ego, but who had made adequate adjustments and had a successful career until she married. She then broke down with a guilt complex. Her husband proved non-cooperative, but his history and the story of their married life show him to be victim of a possessive mother and quite unable to accept the responsibilities of a married man.

All these women had in common a very high ideal of what a marriage partnership should be, and their breakdown, though determined by the usual childhood experiences, was precipitated or aggravated by an unwillingness to face the fact that their marriage was proving a failure. Once they were brought to overcome the sense of disloyalty they felt in criticizing their husbands they found relief in facing the realities of the situation. My last illustration is somewhat different :

The woman was sent to me because in five years of married life the marriage had never been consummated. The reason given was her fear both of intercourse and of pregnancy, amounting to a phobia. A very few talks succeeded in clearing this up. Her phobia was based on sexual ignorance and childish fantasies. After three or four talks she left me as eager as any young bride. Nothing happened, however. Her husband still remained aloof, and it proved that all he wanted in marriage was the comfort of a home and a wife who was a substitute for a mother ; and he was not prepared to face the disruption of his life which the advent of a child would cause.

Other men can no doubt quote parallel cases from their own practices, but my further reason for calling attention to them is that in three of the cases E.C.T. had been recommended as the appropriate treatment, and one of them actually had a course of ten shocks, with devastating effect to her morale and a worsening of her symptoms. The serious thing is that the advocates of E.C.T. made no attempt to understand the cases, and thus were turning their backs on all we have learned about the origins and meaning of neurosis during the last fifty years. I find myself daily appalled by the cases which come under my notice in which shock therapy has been the first, instead of the last, resort. In properly selected cases it has value, but used as indiscriminately as appears to be becoming more commonly the case it ceases to be a scientific procedure and is equivalent to "Let's shake the nonsense out of her." When it is seriously suggested, in cases like the above, that after a failure of E.C.T. leucotomy is the next step I begin to despair of psychiatry.—I am, etc.,

Birmingham. R. MACDONALD LADELL.

Aftercare of the Hospital Patient

SIR,—Dr. J. Greenwood Wilson (March 19, p. 502) tends to adopt the attitude so often displayed by those outside the two professions concerned who discuss what they seem to regard as the rival functions of health visitors and almoners. With regard to the Cardiff scheme for the follow-up of diabetic patients Dr. Wilson says he "would take leave to doubt the ability of almoners anywhere to undertake some important aspects of the work"—i.e., the technical instruction. Almoners themselves would be the first to agree with him. They, however, would not agree that their own specialized training, following the social science course, means that they in any way duplicate the visit of a health visitor "just for social case-work." The health visitor and the almoner, in visiting a patient in his or her own home, do so for different reasons, each fundamentally bound up with the separate and complementary functions they seek to perform.

Earlier in the letter Dr. Wilson actually goes right to the root of the matter when he says, "There is no conflict between health visitors and hospital almoners in Cardiff." I submit that in principle there never need be conflict nor overlapping of function. In effect, there very seldom is where members of the two professions are allowed to work together for the good of the patient without third-party interference.—I am, etc.,

M. STEEL,
London, W.C.1. Secretary, The Institute of Almoners.

Treatment of Varicose Veins

SIR,—Dr. H. M. Hanschell (March 19, p. 500) makes a scathing attack on the use of sclerosants in the treatment of varices. He says that varicose veins left alone carry no mortality, whereas injection with or without ligation may be fatal. "Who dares counter with the sop that varicose veins may become so harsh an affliction of man's estate on earth as to warrant the risk of death in seeking relief ?" My reply to his question is that I do, and herewith venture to make a few comments.

First, it is not true that varicose veins left alone carry no mortality. Embolism from untreated varices is on record, and the fact that they are a "harsh affliction" has been and still is recognized by those dealing with the condition. Two hundred years ago Sir Everard Home tells us, "No surgical complaint incident to the soldier has deprived His Majesty's Services of so many men as that of ulceration of the leg." Again, Birger in 1941 states that in Sweden leg ulcers are a greater cause of disability than both tuberculosis of bones and joints and of diabetes put together. Again, I have called attention to the fact that 10% of the admissions to the E.M.S. hospitals during the war consisted of varicose veins and their complications. Confirmation of the "harshness" of the affliction may be obtained by a very short visit to any varicose clinic, where stinking sloughing ulcers associated with oedematous and painful limbs speak for themselves.

Although the conservative treatment of varices is commendable, active treatment with all the weapons at our disposal is essential in many cases. Sclerosants are a valuable proven adjunct in the destruction of the varix. The mortality occasioned by their proper use is infinitesimal, and the "risk of death" to which Dr. Hanschell refers may virtually be disregarded. I claim that nothing but harm can be done by Dr. Hanschell's reference to sclerosants being dangerous and useless and by his statement that they are used with incomplete knowledge, lack of controls, and without a proper follow-up. Such accusations cannot be made against any properly run clinic.

It is of interest to note that one of the many makers of a popular sclerosant tells me that he supplies over 1,000 litres

of this substance annually. This fact emphasizes the widespread acceptance of the value of these substances. I personally have used sclerosants for nearly a quarter of a century, and, whilst appreciating their limitations and the care necessary in their use, can but deprecate this attack on such a valuable weapon.

Dr. Hanschell's alternative to sclerosants apparently consists in multiple incisions running the length of the varix together with the evulsion and resection of portions of the vein. This treatment was well described by Celsus in A.D. 53 and practised by Galen some 200 years later. Since that time it has been revived and given up by various operators throughout the centuries. Dr. Hanschell says, "If the whole vein is extirpated there is, of course, no recurrence." An inspection of the anatomical ramifications of the superficial venous system should be adequate to convince any operator of the optimism of this statement.

However, all discussion regarding this fascinating subject of varices is of value, since it serves to bring out its great importance. I submit that sclerosants should be used with care and that their dosage may be further diminished in operative work by a proper prior scarification of the venous intima. Again, a special limitation of dosage should occur in all those cases presenting a previous history of deep-vein thrombophlebitis, since in such cases the intima of the deep vein may be sensitized to the effect of sclerosants. Given these and other precautions, the sclerosant is an essential and safe part of modern everyday varicose therapy.—I am, etc.,

London, W.1. R. ROWDEN FOOTE.

Brachial-plexus Block Analgesia

SIR,—Dr. J. V. Fiddian's article, "Simultaneous Embolism in Both Arms" (March 19, p. 480), raises an interesting question from the anaesthetist's point of view. The author states that he exposed the site of embolism in the right axillary artery (presumably the third part) under brachial-plexus block analgesia.

The incision in the conventional approach to the third part of the axillary artery is made through an area of skin mainly innervated by the intercostobrachial nerve (T2 and T3), and only to a lesser degree by the medial cutaneous nerve of the arm from the medial cord of the brachial plexus. According to anatomical textbooks the latter may be entirely absent.

Dr. Fiddian does not mention any additional anaesthesia or analgesia having been employed, and it would be interesting to know whether he was indeed able to perform the operation under brachial-plexus block alone, which, on purely anatomical grounds, would appear to be doubtful.—I am, etc.,

Hull. GORDON M. WYANT.

The Mind and the Skin

SIR,—In his excellent article, "The Mind and the Skin" (March 19, p. 472), Dr. I. B. Sneddon states that he does not agree with psychiatrists that irritation of the anus and vulva always has some deep, dark, sexual significance, but acknowledges that trivial infection, tears in the mucosa, etc., may start a pruritus if the individual is at the time facing some conflict.

He then describes two cases by way of illustration, both of which have an obvious sexual basis. In the first, an obsessional, ultra-clean man gave a detailed description of his anus and perineum "which showed that he had been studying the matter closely"; and in the second, an attractive and well-dressed woman aged 36 developed pruritus when she discovered that her husband had been unfaithful to her.

Few experienced psychiatrists insist that irritation of the anus and vulva "*always*" has some deep sexual significance, but many, however, would agree that a certain number of pruritus cases have that significance, and certainly would not consider the two cases quoted by Dr. Sneddon as evidence to the contrary.

Dr. Sneddon suggests that even with expert psychiatric treatment, such as analysis, success is unusual in cases of pruritus in those who derive some erotic pleasure from scratching, the psychiatric explanation of which, according to Dr. Sneddon, is a form of masturbation. This is an unscientific and unduly despairing observation, which one would not expect from such an experienced and psychologically minded dermatologist as Dr. Sneddon. Even those of us who are not psycho-analysts will not agree that it is difficult to convert erotic scratching into pruritus-free masturbation.—I am, etc.,

London, W.1. ELLIS STUNGO.

Yearly Re-examination by Mass Radiography

SIR,—It has now been possible to analyse the results of the 1948 visit to the factory group whose yearly re-examination by mass miniature radiography was reported in the *Journal* of April 10, 1948 (p. 689). This analysis is shown in the following table. While the incidence among new employees (Group OO) remains the same as for the general population, that for employees with a normal miniature film at the previous survey (Group EX) continues to be about one-third of this figure. Group EO contains those persons employed but not fluorographed at the previous visit. The volunteer response had risen to 80%.

Group	No. Examined	Observation Cases	Treatment Cases	Total (O + T)	Percentage
EX	1,351	3	2	5	0·4
EO	476	4	1	5	1·05
OO	366	5	0	5	1·4
Total ..	2,193	12	3	15	0·7

All cases were minimal in extent, with the exception of one of the treatment cases in Group EX. This was a girl, aged 21, who had had symptoms for six months. She had moderately advanced disease with a cavity in her left lung. In addition, one known case was found to have relapsed.

These figures appear to reaffirm the value of the yearly re-examination of such groups.—I am, etc.,

Denham, Bucks. W. POINTON DICK.

B.C.G. Vaccination in Finland

SIR,—In a recent publication Professor Severi Savonen[1] has given an account of B.C.G. vaccination in Finland since its introduction there in 1941. In 1942 a total of 2,500 tuberculin-negative persons were thus vaccinated, whereas in 1947 as many as 61,200 persons were thus treated. Early in 1948 the Finnish National Association for Combating Tuberculosis (which has been responsible for B.C.G. vaccination in Finland all the time) entered on a campaign of mass vaccination of every tuberculin-negative person between the ages of 15 and 25 years.

This campaign was preceded by the despatch of a personal letter, accompanied by an informative leaflet, to everyone of the above age. The recipients of these letters were requested to present themselves for tuberculin testing and, in the event of their being tuberculin-negative, for B.C.G. vaccination. The association put 21 nurses at the service of this campaign, and it was only nurses who undertook this vaccination. By the end of September, 1948, this campaign had been successfully brought to an end in more than 350 of the some 480 administrative rural districts in Finland. About 30% of the Finns of the above-mentioned age were found to be tuberculin-negative. The association's plan of campaign for 1949 is to vaccinate every tuberculin-negative person in Finland between the ages of 0 and 15 years. It is the ultimate ambition of the association to ensure that everyone in Finland is tuberculin-positive.

The tuberculin testing in Finland is being carried out as a modification of the method described in 1929 by the Italian, Bruno Trambusti. The B.C.G. vaccine is flown by air mail once a week from Gothenburg to Finland, and the tuberculin is supplied in the form of old tuberculin by the State Serum Institute in Copenhagen.—I am, etc.,

Sunnfjord, Bergen, Norway. CLAUDE LILLINGSTON.

REFERENCE

1 *Kvskr. Svensk. Nat. Fören. Tuberk.*, 1948, **4**, 54.

POINTS FROM LETTERS

Analgesia in Childbirth

Dr. O. CAIGER SMITH (Nottingham) writes: In view of the popular and parliamentary interest in the matter of analgesia in childbirth it is surprising that one simple apparatus, already existing primarily for this purpose, has not received more mention. The Young-Simpson inhaler is scarcely mentioned in the books and is rarely described. Consisting of a Woulfe's bottle, a rubber tube, and a face-mask with a variable outlet valve, it delivers to the patient an amount of analgesic commensurate with the amount of pain. Air is drawn through the long metal tube of the Woulfe's bottle, through the anaesthetic, through the short metal tube via the rubber tube to the face-mask. Expired gases pass without obstruction through the simple valve on the face-mask. The valve is so arranged that gentle breathing prevents it from working and pure air only is drawn in. The effect of all this is that severe pain induces a deep breath and provides the patient with a relatively large amount of analgesic at once, while a lesser breath, induced by a lesser pain, draws over a lesser amount of analgesic. The pain centre makes direct arrangements with the respiratory centre. "Trilene" is the anaesthetic of choice at the moment and suits this apparatus very well, though I have had no trouble with chloroform. The apparatus is light and portable, and has an additional advantage over the N_2O machines in that the reserve supplies of anaesthetic can be easily seen, so that there is no danger of the drug running out in the height of battle. I have had no trouble in teaching the use of this apparatus to midwives in a few minutes, and many have wondered why it is not more universally used. I have employed it myself for twelve years to the great satisfaction of patients and myself. The two important rules to ensure absolute safety and effectiveness are: (1) Do not put more than about one inch of trilene in the Woulfe's bottle, and (2) Make sure that the patient has the mask sufficiently firmly applied so that on inspiration air is heard bubbling through the Woulfe's bottle. A loose application to the face means little or no analgesia.

Child Welfare in Africa

Dr. J. O. SHIRCORE (Fort Johnston, Nyasaland) writes: Mr. Norman Emblin's paper entitled "5,000 Consecutive Deliveries without a Maternal Death due to Pregnancy" (Feb. 12, p. 260) is a splendid example of what can be achieved by thorough organization and administration. It may not, however, be out of place—especially as African affairs are now to the forefront—to refer those interested to the *Tanganyika Territory Annual Medical Report* of 1928 (pp. 105–115), in which detailed statistics are given. In this connexion a paragraph from a "Memorandum on the Improvement of Physique of the Native" by the director of medical services of the day (1930) refers to that report as follows: "The death rate for the first ten days of life at the Kahama Clinic, at which 1,129 children were born during 1928, was less than 30 per 1,000." Miss Allardes, nursing sister and health visitor, later matron of the nursing service, was in charge, and she, together with a staff of six African female assistants trained by her, dealt with the whole of that number in the year. The Kahama Clinic was situated at a small district headquarters 80 miles north of Tabora and 35 miles directly west of the Tabora-Mwanza railway, on a road frequently cut off during the rainy season—"out in the blue."

Vitamin A for Iridocyclitis

Dr. DOROTHY MATTHEWS (Johannesburg) writes: During the past four years I have had four attacks of iridocyclitis. These were apparently precipitated by periods of over-work, and no source of infection was found to account for them. The first attack lasted about two months, but the next two were shorter. Sulphonamides and penicillin seemed to have helped a little in these two; during the first only local heat, atropine, and analgesics were used—morphine being necessary for the worst part of the attack. The last bout occurred just over two months ago. I wondered if it might have a dietetic origin, as I dislike fats in general. I took 350,000 units of vitamin A orally immediately, and 60,000 b.d. for the following three days. Within 24 hours of the first dose there was marked improvement. I had inserted no atropine, and the photophobia had gone. There were still physical signs of iridocyclitis, confirmed by an ophthalmologist. Previously I associated vitamin A therapy with corneal conditions only, but in the light of this experience I wonder how many idiopathic cases of iritis may not benefit by similar treatment.

The Ministry of Health states that over 380,000 blood donations were received by the National Blood Transfusion Service last year—90,000 more than in 1947. More blood was used in hospitals in England and Wales last year than in 1944, the peak year of the war. Nearly 100,000 new donors joined the National Blood Transfusion Service in 1948, making a total of 373,778 donors in England and Wales. But to provide for future needs and to reduce calls on existing donors another 200,000 are wanted.

Obituary

PROFESSOR ERNST SCHMIEGELOW

Professor Ernst Schmiegelow, of Denmark, who died on Feb. 28, was a remarkable figure in the world of otolaryngology. He was not only the first in Denmark to hold a professorship in this field, but he was also the first in his younger days to wrest otolaryngology as a specialty from the general surgeons. He was born on Oct. 13, 1856. When, a few years ago, at the age of 90, he published his autobiography, based on his diary, he succeeded in painting a vivid picture of the world of medicine in a great part of two centuries. An indefatigable traveller and participator in international medical conferences, this urbane Dane came to know and to be known by the leading medical men throughout the world, and his younger fellow-countrymen soon learnt how letters of introduction from him opened countless doors abroad. When in 1883 Schmiegelow opened a polyclinic for patients with diseases of the ear and throat in Denmark the surgeons did their best to put him out of countenance. In 1929 Schmiegelow's standing in his own specialty was officially recognized by his selection as president of the First International Oto-Laryngological Congress in Copenhagen.

Dr. VICTOR DAMIAN PENNEFATHER died in Southampton on March 25 at the age of 53. In 1917 he qualified in Singapore, and after working there and at Dar-es-Salaam he came to England and became a student at the London Hospital. He served as a captain in the R.A.M.C., and in 1922 obtained the Conjoint diploma. He then worked at Lyndhurst, in the New Forest, for a number of years, and finally took over a busy practice in Southampton. The strain of overwork during the recent war was a factor in the development of the illness which forced him to retire two years ago. Dr. Pennefather was conscientious and able, and he was an active member of the B.M.A. and the Southampton Medical Society. He was well liked by his patients and colleagues, and will be missed by many. He showed great fortitude and patience during his prolonged and trying illness, and the sympathy of his colleagues and friends will be extended to his wife, who nursed him during his illness—S. N. L.

Dr. HERBERT EBENEZER EDLIN died at his home in Levenshulme, Manchester, on Feb. 23 at the age of 86. Dr. Edlin was educated at Manchester Grammar School and at Owens College, qualifying in 1884. In that year he succeeded to his father's practice and was also appointed medical officer of health for Levenshulme, an appointment which he resigned only in 1909 after twenty-four years' service. He was interested in the work of the St. John Ambulance Brigade and was for many years a lecturer and examiner in first-aid. During the 1914–18 war he acted as honorary secretary to the local Red Cross hospital, and was also on the staff of the military hospital at Alma Park. In the recent war he took charge of a first-aid post at Stanley Grove, and he only retired from practice in October, 1947, a few months after his 85th birthday. Dr. Edlin had lived in Levenshulme since early childhood, and he saw it grow from a village with a population of about 2,500 to its present size. He was popular with his patients and greatly esteemed by his colleagues. The sympathy of all who knew him will be extended to his widow and his son.

Mr. ARTHUR HERBERT BUCK, who died at Dereham, Norfolk, on March 9 at the age of 79, had a distinguished surgical career in Sussex up to his retirement in 1921. As a boy he had a voice of great beauty and was a chorister of King's College Chapel, Cambridge. He perhaps inherited some of the musical talent of his grandfather, Zachariah Buck, the renowned organist of Norwich Cathedral. After qualifying from St. Bartholomew's Hospital in 1892, the year in which he won the Brackenbury Scholarship, he became senior house-surgeon at the Royal Sussex County Hospital, Brighton, and remained there for three years. He was elected assistant surgeon to the hospital in 1899, two years after he had taken the F.R.C.S.Ed., and full surgeon in 1909. Buck was full of zeal for the then new aseptic technique and was the first to practise it in Brighton. He soon became known as a bold and dexterous surgeon, and for many years he and the late Mr. Reginald Jowers shared between them most of the surgical work of Brighton and mid-Sussex. Buck was also surgeon to the Brighton and Sussex Throat and Ear Hospital from 1901 onwards. Though of all-round ability, his special leaning was towards abdominal

surgery, in which he excelled. He took great pains with his after-treatment, often employing original methods, some of which stood the test of time while others did not. Buck was attached to the 2nd Eastern General Hospital during the 1914–18 war, with the rank of major. After the war ended he retired at a somewhat early age and took himself and his family to Vancouver Island, where they spent twelve happy years. He had always been an enthusiastic yachtsman, sailing on the south coast and the Norfolk Broads, and he was an equally fine fisherman. These two hobbies he was able to enjoy to the full from his home on the Island. When the time came for his son, John, to start his medical studies in Edinburgh, the family returned to England. Some financial losses had been suffered, and with characteristic resolution Buck decided to get into harness again. Surgery held no prospects after twelve years' absence, so he proceeded to do "locums" in Norfolk and elsewhere until his son had qualified. Six years ago Buck was stricken by a fatal illness and underwent several operations. These and their attendant discomforts and anxieties he met with much fortitude, always cared for by his devoted wife. Her sudden death, eighteen months ago, shattered him, and the end came with a kindly hand. His life had held both storm and sunshine, and in all circumstances his outstanding virtue was courage.—H. N. F.

Dr. HENRY COLIN MACLAREN, who died in Carlisle on March 17 at the age of 37, was honorary anaesthetist to the Cumberland Infirmary and the Carlisle group of hospitals. He was born in Carlisle, and was the youngest son of the late Norman Maclaren, F.R.C.S., who was honorary surgeon to the Cumberland Infirmary, Carlisle. He was educated at Oundle, Trinity College, Cambridge, and St. Bartholomew's Hospital. He graduated in 1937 and took the D.A. in 1940. After resident appointments at St. Bartholomew's Hospital and at Winchester he returned to Carlisle and was appointed anaesthetist to the Cumberland Infirmary in 1939. From 1942 he served in the R.A.M.C. as a specialist anaesthetist in North Africa, Italy, and Austria. On demobilization in 1946 he took up practice in Carlisle again. Dr. Maclaren was honorary secretary of the Border Counties Branch of the British Medical Association, and had previously been honorary secretary of the Cumberland Division. With the death of Colin Maclaren, Carlisle has lost a man of great promise. He had a happy personality, and he proved in his last long illness how great was his courage. He is survived by a widow and two young sons, to whom the sympathy of many friends and colleagues will be extended. —F. J. S.

Dr. THOMAS MORRISON CLAYTON, who died on March 21 after a long illness, had a distinguished career as medical officer of health and school medical officer of Gateshead. Dr. Clayton was born at Felling in 1870, graduated at the University of Durham in 1894, and practised in his native town for some years, becoming its medical officer of health in 1896. Six years later he succeeded Dr. R. Greene as the fourth whole-time medical officer for Gateshead, a town which shared the unenviable reputation of industrial Tyneside generally as an unhealthy area. He belonged to the generation for which preventive medicine was mainly directed to improvements in environment and the control of infectious diseases. He became an expert epidemiologist, with considerable experience of outbreaks of smallpox and typhus, being much concerned with the last two local outbreaks of the latter disease in 1907 and 1910. It was also in 1907 that Dr. Clayton initiated school medical inspection in Gateshead, and he organized the maternity and child-welfare clinics there in 1919. Throughout his service he was medical superintendent of Sheriff Hill Isolation Hospital, and he started the extension of the Gateshead municipal hospitals with the opening of Whinney House Sanatorium in 1925. In the sphere of hospital development Dr. Clayton was gravely handicapped by the poverty of the town, which became a "distressed area" in the post-war slump, and he had retired from active work before the grants from the Special Areas Commissioner became available for the building of the new municipal hospitals, which were the logical result of much of his work. His retirement in 1936 brought to an end his thirty-four years' service in Gateshead. Clayton was an authority on infectious diseases and one of the earliest to criticize the theory of the aerial convection of smallpox, ascribing the apparent examples of such spread rather to human contact, a thesis which in 1905 he put before the leading sanitarians of the country. In 1908 he was elected a fellow of the Royal Society of Edinburgh. An excellent raconteur, he had the knack of smoothing out administrative and other difficulties with a well-timed and pointed anecdote. He is survived by two daughters and three sons; one son is a veterinary surgeon and two are medical officers of health. To all his family the sympathy of his colleagues and friends will be extended.—J. G.

Dr. C. Lillingston writes: Dr. J. R. Conner (March 26, p. 549) used to describe himself as a literary hack. To those who knew him well this was an understatement with a vengeance. To be sure, he was a master of the technical side of medical journalism, and he took infinite pains in practising and teaching the reporting of medical news in concise English, purged of all that was slipshod. Such redundancy as "curiously enough" was anathema to him. Why, he would ask with intense exasperation, do you drag in "enough" when you know quite well that here it means nothing at all, at all? *The Medical Review*, which Conner owned and edited for many years, was devoted exclusively to abstracts of original articles published at home and abroad. Here he revelled in the delicate and responsible task of sifting the wheat from the chaff. At a later stage he was the tireless and efficient editor of the *Clinical Journal*. Conner was still less of a literary hack in the part he played as the regular London correspondent of the *Journal of the American Medical Association*. Here he had full scope for his talents as a shrewd observer of, and commentator on, the world of medicine. As a reporter of events he was impartial and objective. He was so, too, as a biographer. But when, as happened occasionally, the subject of a medical biography inspired him, he came out of his shell, a self-confessed hero-worshipper. He did so in prose of a quality which recalled the saying that it takes an Irishman to write the best English. Conner was Irish to the marrow, from his ancestry to his brogue. But he was very appreciative of the Anglo-Saxon character, though when he referred to the Anglo-Saxon's love of compromise he did so rather as the detached observer of a natural phenomenon than as a breathless admirer of it. For, truth to tell, Conner had no taste for compromise when the rights and wrongs of a case were self-evident. Indeed, his uncompromising rectitude must often have troubled him as much as it won the admiration of the friends who knew him best.

Medico-Legal

N.H.S. TERMS OF SERVICE

Doctor Censured

The Derbyshire Executive Council at its meeting on Feb. 17 unanimously approved a report from the Medical Service Committee recommending that a doctor should be severely censured and that a sum of £10 should be withheld from his remuneration.

The committee had investigated a complaint made against a medical practitioner by the father of a baby girl, aged 10 months, who died on Nov. 27, 1948. The substance of the complaint was: (1) that although three urgent requests for a visit by the doctor were made on Saturday, Nov. 27—namely, at 7.55 a.m., 4 p.m., and 5.30 p.m.—no doctor arrived until 6.30 p.m.; (2) that no examination was made until Saturday, Nov. 27, 1948, when an assistant doctor examined the child. The complainant attended the hearing and brought with him as witnesses his wife and mother-in-law. The respondent doctor (who is in partnership with another doctor and has two assistants) attended but did not bring any witnesses.

It was accepted in evidence that the name of the doctor was included in the Council's Medical List, and that, having signed Form E.C.16, he had undertaken to accept service and to be bound by the terms of service in operation in the area; also that the deceased child was accepted by the doctor and registered on his list with effect from July 5, 1948.

The father stated that on Tuesday, Nov. 23, his child started to vomit and pass a green motion; that on Wednesday, Nov. 24, 1948, he telephoned to the doctor's surgery; that one of the assistant doctors arrived at the house and prescribed tablets but did not make any examination. On the night of Thursday, Nov. 25, the child started to breathe heavily, and on the following morning the father again telephoned to the doctor's surgery. The other assistant came to the house, saying that the child's condition was due to the effect of the tablets and that there was nothing to worry about. The father was emphatic in stating that on the occasion of both visits no examination was made. On Saturday, Nov. 27, on returning from work at 6.30 a.m., the complainant said his wife and mother-in-law told him they had been up all night with the child, and at 7.55 a.m. he went to the house of the doctor, whose wife answered the

door, and told her his daughter was very ill and breathing heavily. The doctor's wife said she would speak to the doctor. The father asked her to inquire of the doctor if it would be all right to give the child a drop of brandy. The doctor's wife came back with the message "not to give any brandy but that the doctor would come along." At 4 p.m., as the child was gasping for breath and no doctor had arrived, the father said he again telephoned the doctor, whose wife answered the telephone and said one of the doctors would call. The father went on to say that at 5.30 p.m. still no doctor had arrived, and he telephoned again and was answered by the doctor's wife, who said, "Hold on whilst I speak to the doctor," and that when the doctor's wife again answered she said it was one of the assistant doctors' "off-duty" day but that the other assistant would call. At 6.30 p.m. the assistant doctor arrived, examined the child, and said it was pneumonia. At about 7.30 p.m. the same night an ambulance arrived and the child was taken to hospital, arriving there about 9 p.m. The child died between 10.30 and 11 p.m. the same evening from bronchial pneumonia. The complainant's statement was corroborated in evidence by his wife and mother-in-law.

The respondent doctor in his statement maintained that there was no neglect and that by prescribing sulphapyridine tablets the necessary precautions had been taken. The doctor further contended that there was no serious condition of the child until the morning of Saturday, Nov. 27, and that following the early-morning call by the complainant he left a note on the assistant's desk so that it would be seen immediately on the assistant's arrival for the morning surgery. He made the admission, however, that he had quite forgotten it was the assistant's "off-duty" day. The doctor stated that directly after returning from visiting patients at 6 p.m. one of the assistants went to see the child.

After a lengthy hearing the committee found as follows: (1) That it was not until approximately 6.30 p.m. on Saturday, Nov. 27, 1948, that the assistant doctor visited the child, although the complainant personally delivered an urgent message at the doctor's house at 7.55 a.m. that day, followed by two further telephonic requests made by the father at approximately 4 p.m. and 5.30 p.m. (2) That up to Saturday, Nov. 27, the committee found no evidence of inattention. (3) That there was a degree of negligence on the part of the principal doctor in not responding more promptly, either personally or by deputy, to the father's request made on the morning of Saturday, Nov. 27, 1948.

The committee recommended: "That the doctor be severely censured and warned to exercise more care in the observance of his terms of service under the National Health Service Act, and that representations be made to the Minister that, owing to the failure of the doctor to comply with the terms of service, a sum of £10 be withheld from his remuneration."

Medical Notes in Parliament

Psychiatric Treatment of Homosexual Offenders

Replying on March 28 to Mr. WILKINS, Mr. EDE stated that no psychiatrists were employed full-time in the prison service. Six were engaged in a part-time capacity. Five prison medical officers possessed special psychiatric qualifications, and many others had mental hospital experience. There were now 412 prisoners serving sentences for homosexual offences. Prisoners convicted of these offences who in the opinion of the medical officer might benefit by psychiatric treatment were transferred to the prisons at which there were psychiatric clinics if their sentences were long enough. During the past six months 40 homosexual offenders received psychiatric treatment at these centres, and, of those at present under sentence, 35 additional cases had received psychiatric examination and guidance at other prisons. Arrangements had also been made to extend the psychiatric service available to prisoners who might benefit from treatment but could not be removed to the special centres. Research, partly therapeutic in character, into the psychological and endocrinological aspects of homosexuality was being conducted at two selected prisons, and homosexuals might also benefit from research now in progress into psychopathic personalities.

Universities and Colleges

UNIVERSITY OF LIVERPOOL

S. Ghousuddin has been approved for the D.P.H. (Part I).

UNIVERSITY OF LEEDS

The following candidates have been approved at the examinations indicated:

M.D.—R. C. Gledhill, J. S. Thorburn.

CH.M.—R. A. Hall, R. E. Shaw.

FINAL M.B., CH.B.—*Part III* (*Medicine, Surgery, Obstetrics and Gynaecology, Therapeutics*): Nora E. Brown, D. Burrell, Hazel M. Coleridge, R. S. Colwyn, E. L. Copley, Frances M. Cottam, P. H. Daley, W. P. Goodyear, Ida Mather, J. E. Miller, Anne B. Neil, Cynthia M. Perlman, K. Platts, Mary C. Robertson, J. Sagar, M. H. Singer, Doreen W. Steinbrecher, D. J. Stephens, Joyce M. Teasdale, Margaret Winton. *Part I* (*Pathology and Bacteriology, Pharmacology*): Margaret Anderson, Cynthia Barnett, Audrey M. Bolton, Dorothy Broomhall, Jean M. Burnett, E. M. Calverley, J. I. Currie, T. G. Dobie, D. Duncalf, M. Dunsby, W. G. C. Forrester, Mary Hallowell, Marion Hanson, J. G. M. Harrison, Anne E. T. Haw, Marjorie Haw, [1]E. T. Heath, J. M. Hirst, B. R. G. Hutchinson, Margaret Hyde, [1 2]Mary McMillan, R. J. Mahabir, P. Mellor, E. Morton, K. A. Naylor, A. Nugent, Margaret Penny, Mary G. Pullan, Margaret Rogers, [1 2]R. E. Rossall, P. B. Rowe, Audrey W. Scothorne, J. A. Sharp, M. W. Sharp, S. Sheffrin, P. D. Sinclair, K. Stewart, [1]K. R. Thornton, [2]W. Turner, D. C. Twist, Barbara M. Wadsworth, E. R. Watson.

[1] Distinction in Pharmacology. [2] Distinction in Pathology and Bacteriology.

The following Scholarships and Prizes have been awarded: *Medical Scholarship*, R. Beaumont. *McGill Prize in Clinical Surgery*, E. L. Copley. *Waddington Prize in Anatomy*, D. N. Laurence.

ROYAL COLLEGE OF PHYSICIANS OF LONDON

The Croonian Lectures, on "Malaria, with Special Reference to Recent Experimental, Clinical, and Chemotherapeutic Investigations," will be delivered by Dr. N. Hamilton Fairley, F.R.S., before the College (Pall Mall East, S.W.) on Tuesday and Thursday, May 3 and 5, at 5 p.m.

ROYAL COLLEGE OF SURGEONS OF ENGLAND

Professor Robert I. Harris, Associate Professor of Surgery in the University of Toronto, has been elected an Honorary Fellow of the Royal College of Surgeons of England. He will be admitted as an Honorary Fellow on April 29, when he will deliver before the College (Lincoln's Inn Fields, London, W.C.) a Hunterian Lecture on "Spondylolisthesis."

SOCIETY OF APOTHECARIES OF LONDON

Professor E. C. Dodds, F.R.S., presided, as Master, at recent meetings of the Court of Assistants. Dr. J. P. Hedley was re-elected to represent the Society on the Central Midwives Board for a further year from April 1. The Society's Gillson Scholarship in Pathology will in future be awarded every third year, beginning in 1952, in the sum of £500. It was resolved to confer the Honorary Freedom of the Society upon Sir Charles Harington, F.R.S., in recognition of his work in the field of biochemistry and chemical pathology. The Gold Medal of the Society for 1949 will be bestowed upon Professor Jacques Tréfouël, Director of the Institut Pasteur, Paris, in May, in commemoration of his contribution to scientific advancement in the field of therapeutics. The report of the death in a railway accident of Dr. Francis S. Curd, Gold Medallist, was received with regret. A further course of ten lectures on modern therapeutics will be given in the week beginning Dec. 5 next.

The Diploma of Mastery of Midwifery was granted upon examination to G. Bridge.

The following were granted the Diploma in Industrial Health upon examination: N. Graham, T. G. Jones, G. M. MacBain, T. E. M. Wardill.

The Diploma of L.M.S.S.A. was granted upon examination to the following successful candidates: H. H. B. Perkins, C. M. D. Davies, M. A. R. Stilson, H. D. Isaacs, A. Paes, M. J. Beilin, J. A. A. R. Venniker, E. G. Dimopoulos, M. Caller, J. K. Jones, M. G. Kaye, T. Bell, J. R. Deacon, D. L. Stilson, J. D. Whittall, T. Brearley, J. R. Dyson, T. Pimblett, C. Jones, R. W. E. Brain, R. Raynham, N. H. Porter, R. F. Maddox, D. L. Stewart, A. P. Caspers, R. Payne, G. Williams, H. G. Damant, B. E. L. Thompson, N. H. Bamford, E. F. Stafford, M. H. Symes, E. A. Brown.

The High Commissioner for Eire has asked that when it is found desirable to transfer patients to hospitals in Eire the transfer should be arranged through his office and not directly with the hospital in Eire. Hospitals which are arranging to transfer patients should send full particulars, including a medical report and information about the district to which the transfer is desired, to the High Commissioner at 33–37, Regent Street, London, S.W.1. The High Commissioner's Office will then make whatever arrangements are possible for the reception of the patient.

No. 11

INFECTIOUS DISEASES AND VITAL STATISTICS

We print below a summary of Infectious Diseases and Vital Statistics in the British Isles during the week ended March 19.

Figures of Principal Notifiable Diseases for the week and those for the corresponding week last year, for: (a) England and Wales (London included). (b) London (administrative county). (c) Scotland. (d) Eire. (e) Northern Ireland.

Figures of Births and Deaths, and of Deaths recorded under each infectious disease, are for: (a) The 126 great towns in England and Wales (including London). (b) London (administrative county). (c) The 16 principal towns in Scotland. (d) The 13 principal towns in Eire. (e) The 10 principal towns in Northern Ireland.

A dash — denotes no cases; a blank space denotes disease not notifiable or no return available.

Disease	1949					1948 (Corresponding Week)				
	(a)	(b)	(c)	(d)	(e)	(a)	(b)	(c)	(d)	(e)
Cerebrospinal fever ..	57	5	15	1	1	49	5	23	1	3
Deaths		—	—				1	—		
Diphtheria	114	9	28	3	1	173	19	53	15	5
Deaths	—	—	1	—	—	—	—	—	—	—
Dysentery	35	4	13	—	—	170	17	30	—	1
Deaths				—	—				—	—
Encephalitis lethargica, acute	—	—	—	—	—	1	—	1	—	—
Deaths		—					—			
Erysipelas			29	13	5			49	7	6
Deaths		—					—			
Infective enteritis or diarrhoea under 2 years				18					13	
Deaths	37	4	6	4	3	59	4	11	2	—
Measles*	16,275	1231	292	118	168	10,034	1716	505	112	37
Deaths†			—	—	1			2	—	—
Ophthalmia neonatorum	56	4	15	—	—	92	5	9	—	—
Deaths										
Paratyphoid fever ..	2	—	—	—	—	2	1	—	1 (B)	—
Deaths	—	—	—	—	—	—	—	—	—	—
Pneumonia, influenzal ..	1,524	66	23	20	9	963	53	7	5	5
Deaths (from influenza)‡	360	31	6	3	6	20	7	2	1	1
Pneumonia, primary ..	488	71	247	46	21	232	40	295	24	7
Deaths				10					4	
Polio-encephalitis, acute	—	—				2	—			
Deaths										
Poliomyelitis, acute ..	18	—	1	1	—	20	2	1	2	—
Deaths§	1	—				2	—			
Puerperal fever		—	13				1	14		—
Deaths										
Puerperal pyrexia‖ ..	104	8	5	2	—	145	6	11	—	—
Deaths		—					—			
Relapsing fever ..	—	—			—	—	—			—
Deaths										
Scarlet fever	1,209	63	179	138	44	1,847	118	302	37	59
Deaths†			—	—	—			—	—	—
Smallpox	—	—	—	—	—	—	—	—	—	—
Deaths				—	—				—	—
Typhoid fever ..	3	—	—	3	—	6	—	1	1	—
Deaths	—	—	—	—	—	—	—	—	1	—
Typhus fever	—	—	—	—	—	—	—	—	—	—
Deaths				—	—				—	—
Whooping-cough* ..	2,790	221	272	57	62	3,304	246	61	46	10
Deaths	15	1	2	5	2	9	2	—	—	2
Deaths (0–1 year) ..	333	40	42	36	14	357	57	50	9	10
Infant mortality rate (per 1,000 live births)										
Deaths (excluding still-births)	7,429	1094	744	230	195	4,941	839	616	192	132
Annual death rate (per 1,000 persons living)			14·9	14·3				12·4	12·0	
Live births	8,103	1256	967	339	260	8,366	1347	1057	400	228
Annual rate per 1,000 persons living ..			19·4	21·0				21·3	25·0	
Stillbirths	202	23	27			222	33	27		
Rate per 1,000 total births (including stillborn)			27					25		

* Measles and whooping-cough are not notifiable in Scotland, and the returns are therefore an approximation only.

† Deaths from measles and scarlet fever for England and Wales, London (administrative county), will no longer be published.

‡ Includes primary form for England and Wales, London (administrative county), and Northern Ireland.

§ The number of deaths from poliomyelitis and polio-encephalitis for England and Wales, London (administrative county), are combined.

‖ Includes puerperal fever for England and Wales, Eire, and Northern Ireland.

EPIDEMIOLOGICAL NOTES

Smallpox

A passenger aged 69 who became ill about March 21 on board the s.s. *Mooltan* during a voyage from Australia died at sea on April 1. The fatal illness, at first believed to be chickenpox, was later found to be smallpox. The ship arrived in the Port of London on April 2 with 953 passengers and 441 crew. All except two of these persons were either vaccinated or revaccinated before leaving the ship on April 3. Local health authorities are being advised of the names of these persons and of the addresses to which they have gone, also of the names and addresses of a number of persons coming to the United Kingdom who left the ship at Marseilles on March 25 without being vaccinated. The widow of the passenger who died was taken ill on April 3 and has been removed to a smallpox hospital. Passengers and crew on the ship were at risk of being infected by smallpox for about a week before they were vaccinated or revaccinated. The vaccination of contacts after exposure to infection cannot be relied upon to afford complete protection, and there is a likelihood that further secondary cases may appear during the next fortnight. Medical practitioners called to see any passenger or member of the crew from the s.s. *Mooltan* during the next few weeks are asked to consider the possibility of smallpox, and if in doubt to inform the local medical officer of health, who will be prepared if necessary to obtain the advice of a consultant.

Influenza

There were 327 deaths in the great towns in the week ended March 26 as against 360 in the previous week. The numbers increased in the Midlands, but decreased elsewhere. The majority of the deaths occurred in old people. This fall in the weekly total of deaths brings to an end an increase that has continued over the past seven weeks. An exceptional feature of the present outbreak has been the persistence of a rising mortality so late in the year. The latest period for a maximum figure during recent years was the eighth week in 1940. The number of deaths occurring in the first eleven weeks of this year is the largest for the past ten years except for 1941 and 1946.

Provisional Figures for 1948

Provisional figures given in the Registrar-General's return for the quarter ended Dec. 31, 1948, show that the general death rate in 1948 was the lowest ever recorded in this country. It was 10.8 per 1,000 total population, compared with 12.0 in the previous year and the previous lowest figure of 11.4 in 1930 and 1945. The infant mortality rate was 34 per 1,000 related live births. This is the first time the annual rate has fallen below 40 and is an improvement of 7 per 1,000 on the previous lowest in 1947. The improvement in infant mortality in this country in recent years compares favourably with the experience of other countries, although some still have lower rates—for example, the provisional 1947 rate for Sweden was 25. The proportion of stillbirths to total births was 23.1 per 1,000, or 1.0 lower than the best previous figure, which was also in 1947.

There was a fall in the birth rate from 20.6 per 1,000 total population in 1947 to 17.9 in 1948, but the effective reproduction rate (provisional) is still above one. Included in the return are three graphs which give a comparison of the numbers of live births, deaths, and marriages during and after the two world wars.

The total population of England and Wales at June 30, 1948, is given as 43,502,000 (males 21,091,000, and females 22,411,000). Projections of the total population of England and Wales by sex and age to mid-1950 and mid-1960 give the total population at those dates as 43,685,000 and 44,906,000 respectively: these projections are, of course, made upon certain assumptions—for example, that births will be at the rate of 700,000 per annum to mid-1955 and at the rate of 650,000 thereafter. A summary of these projections shows how the proportions of children and of people over 45 years of age in the population are expected to increase at the expense of the younger adult population.

Discussion of Table

In *England and Wales* an increase was recorded in the notifications of whooping-cough 169, scarlet fever 31, cerebrospinal fever 22, and diphtheria 13. There was a decrease in the incidence of measles 1,030 and dysentery 14.

The largest falls in the notifications of measles were Staffordshire 196, Southampton 164, Cheshire 126, Warwickshire 114, Yorkshire West Riding 113, and Worcestershire 104. The incidence of measles increased in London and the surrounding counties in contrast to the remainder of the country; the largest rises were London 197 and Kent 92.

The largest local variation in the notifications of scarlet fever was an increase of 24 in Essex. Notifications of diphtheria increased by 9 in Lancashire. The largest rises in the incidence of whooping-cough were Yorkshire West Riding 44 and London 32.

Only 35 cases of dysentery were notified—the lowest weekly total since December. The 57 notifications of cerebrospinal fever provided the largest total for over a year; the cases were scattered throughout the country.

In *Scotland* increases were reported in the notifications of measles 128 and whooping-cough 41. The 13 notifications of dysentery gave the lowest figure for over a year. Notifications of scarlet fever increased by 16 in the south-eastern area but declined in the other areas.

In *Eire* there was a fall of 19 in the notifications of measles and a rise of 36 in the incidence of scarlet fever. Only 18 cases of diarrhoea and enteritis were notified, the lowest total during recent months. The chief centres of scarlet fever were Dublin C.B. 72 and Donegal, Stranolar R.D. 31. Of the 118 cases of measles 95 were notified in Dublin C.B.

In *Northern Ireland* a fall was reported in the notifications of measles 14, and there was a rise in the incidence of scarlet fever 22. The notifications of measles rose by 24 in County Antrim and fell by 42 in County Down. The rise in the incidence of scarlet fever was general throughout the country.

Health of Scotland in 1948

Infant mortality in 1948 reached the record low level of 44.7 per 1,000 compared with 55.8 in 1947 and 59 as the average of the past five years. The general mortality was 11.8 per 1,000. Deaths from respiratory tuberculosis numbered 3,417, which was 28 more than in the preceding year. The increase in the notifications of respiratory tuberculosis continued. The provisional figure for 1948 is 8,010, which may be compared with 4,657 in 1939. The figures for non-respiratory tuberculosis showed an improvement; deaths and notifications were 221 and 250, respectively, fewer than in 1947.

Week Ending March 26

The notifications of infectious diseases in England and Wales during the week included: scarlet fever 1,357, whooping-cough 2,978, diphtheria 117, measles 15,307, acute pneumonia 1,547, cerebrospinal fever 39, acute poliomyelitis 15, dysentery 34, paratyphoid 7, and typhoid 3.

Medical News

Proceedings of the Annual Meeting, 1948

The volume of the *Proceedings* of the Association's Annual Meeting at Cambridge last year has been published (Butterworth and Co., London) and is reviewed on p. 620. Between Sir Lionel Whitby's presidential address, with which the book opens, and the lecture on "Accident and Opportunism in Medical Research," by Sir Henry Dale, O.M., F.R.S., with which it ends, leading authorities on the science and practice of medicine, including surgery and obstetrics, discuss the recent advances in their own specialty. The book is attractively produced and contains a subject index.

Dr. Garrett Brownrigg

Dr. Garrett Brownrigg, formerly President of the Newfoundland Medical Association and Physician at Government House, Newfoundland, has been appointed C.B.E. (Civil Division).

Women in the Community

The Liberal Party Assembly recently discussed women's place in the community and in the health services. Mrs. Wendy Wills moved that there should be a common portal of entry into the nursing profession with 18 to 24 months' basic training. Passing an examination at the end of the course would give the right to State registration as an "enrolled nurse." An advanced course would be taken for qualification as a State-registered nurse. Efforts should be made to attract and train as "nursing aides" women who cannot undertake the full basic training but wish to be associated with the care of the sick. She had found that only a small minority felt a call to enter the nursing profession; the choice was often governed by the important factor that the training was largely free. Hospital posts were hard to fill mainly because hours of work, pay, and personal freedom compared unfavourably with conditions offered in public health and welfare services and in industrial nursing, where applicants outnumbered vacancies. Mrs. Doreen Gorsky emphasized that men and women must be regarded as equal partners in marriage, and moved that more adequate maintenance allowances should be made legally possible, particularly where there are young children. The wife and children should have greater protection from the man who tries to evade his obligations for maintenance, and the courts should be able to give both parties an equitable share of the contents of their home and savings acquired by their joint effort during marriage.

Blood Transfusion Research Committee

The Medical Research Council has decided to reconstitute its Blood Transfusion Research Committee to advise and assist it in dealing with new problems arising in the course of work on dried blood and dried-blood products. The following have been appointed as members of the new committee in the first instance and have agreed to serve: Dr. A. D. Drury, F.R.S. (chairman); Dr. R. J. Drummond, Regional Blood Transfusion Officer, Cardiff; Mr. R. A. Kekwick, D.Sc., the Lister Institute; Dr. J. F. Loutit, Director of the M.R.C. Radiobiological Research Unit, Harwell; Dr. R. G. Macfarlane, clinical pathologist, Radcliffe Infirmary, Oxford; Dr. M. Maizels, clinical pathologist and University Reader, University College Hospital; Dr. d'A. Maycock, the Lister Institute, adviser on blood transfusion to the Ministry of Health; Dr. P. L. Mollison, Director of the M.R.C. Blood Transfusion Research Unit; and Dr. R. R. Race, Director of the M.R.C. Blood Group Research Unit.

Trained Nurses' Salaries

In view of the dissatisfaction felt by trained nurses throughout the country on delay in arriving at a decision about revision of their salaries the Staff Side of the Nurses and Midwives Whitley Council state that proposals for certain revisions were submitted to the Management Side on Feb. 1. A meeting with the Management Side was arranged and was later postponed at the request of the Management Side. The postponed meeting fixed for a later date was also cancelled by the Management Side. On the Staff Side's approaching the Minister it was learned that the claim, which raises issues of considerable financial importance, is being considered, and it is hoped that the Management Side will shortly be in a position to reply to the Staff Side's proposals.

Care of Whalemeat

The Food and Drugs (Whalemeat) Regulations, 1949, which came into operation on March 20, govern the importation of whalemeat into England and Wales and the conditions for storing and selling it. The regulations require a veterinary certificate for whalemeat and whalemeat products intended for human consumption. The whalemeat must have been inspected and produced in accordance with conditions satisfactory to the Minister of Food. The regulations are to be enforced by port health authorities and local authorities. A memorandum has also been issued setting out the conditions for transporting, packing, and storing whalemeat and the provisions for inspecting it. The memorandum will be reviewed in the light of experience gained during this season's whaling expeditions in the Antarctic.

Wills

Dr. John Bruce, a former provost of Forres, left £37,122. Dr. Frederick John Blackley, of Southampton, left £27,211; and Dr. Edward John Cross, of Eynesbury, Hunts, £7,043. Mr. Albert Edwin Hayward Pinch, formerly director of the Radium Institute, London, left £27,924; after making a number of bequests he left the residue of his estate to his wife for life, with remainder as to half to the Medical College of St. Bartholomew's Hospital, to help necessitous students, and half to the Faculty of Medicine of the University of Bristol, similarly.

COMING EVENTS

Regional Consultants Committee for Oxford

A meeting of the Oxford Region Consultants and Specialists Committee will be held at Radcliffe Infirmary, Oxford, on April 10, at 3 p.m., to discuss the proposed terms and conditions of service of hospital medical and dental staff.

British Orthopaedic Association Meeting

The spring meeting of the British Orthopaedic Association will be held at Nottingham in the Great Hall of the University on April 22–23. The programme includes the following papers. April 22: Mr. D. Trevor on "Spontaneous Rupture of Extensor Pollicis Longus Tendon following Colles's Fracture"; Mr. N. W. Roberts on "Osteochondritis Desiccans of the Elbow Joint"; Mr. T. Rowntree on "Anomalies in the Innervation of the Muscles of the Hand"; Mr. R. G. Pulvertaft on "Tendon Surgery in the Hand" (film). April 23: Mr. P. C. Elmes on "Fractures of the Neck of the Femur"; Mr. R. C. Murray on "Trochanteric Fractures of the Femur"; Mr. J. Rowland Hughes on "Radiological Diagnosis of Recent Lesions of the External Lateral Ligaments of the Ankle"; Professor J. Delchef on "Nerve-root Pain of Vertebral Origin not Dependent on Disk Prolapse"; Mr. E. Mervyn Evans on "Pronation Fractures of the Forearm with Special Reference to the Anterior Monteggia Fracture"; Mr. W. B. Foley on "Ischio-femoral Arthrodesis of the Hip by Posterior Open Approach" (film).

International Congress on Rheumatic Diseases

Among the speakers at the International Congress on Rheumatic Diseases to be held in New York on May 30-June 3 will be Lord Horder on "Rheumatism, a National Problem," and Dr. William Tegner on "Some Aspects of Psychogenic Rheumatism."

International Hospital Congress

The International Hospital Federation will hold its first International Hospital Congress in Holland at Amsterdam and Groningen on May 30-June 4. The design of hospitals and the training and duties of hospital administrators are among the subjects to be discussed. Further particulars may be obtained from Captain J. E. Stone, King Edward's Hospital Fund for London, 10, Old Jewry, London, E.C.2.

SOCIETIES AND LECTURES

Monday

MEDICAL SOCIETY OF LONDON, 11, Chandos Street, Cavendish Square, London, W.—April 11, 8.30 p.m., Discussion: *"Acute Cholecystitis,"* to be introduced by Dr. E. R. Cullinan and Mr. Guy Blackburn.

Tuesday

MIDDLESEX COUNTY MEDICAL SOCIETY.—At West Middlesex Hospital, Isleworth, April 12, 2.45 p.m., general meeting.

Wednesday

SOCIETY OF CHEMICAL INDUSTRY: FOOD GROUP.—At Royal Sanitary Institute, 90, Buckingham Palace Road, London, S.W., April 13, 6.30 p.m., 18th annual general meeting. *"Some Thoughts on the Food Group,"* by Dr. E. B. Hughes.

APPOINTMENTS

BURN, A. TELFORD, M.B., B.S., D.P.H., Medical Officer of Health for the Borough of Sale and the Urban District of Lymm, and Divisional Medical Officer to the Cheshire County Council.

NEWNS, G. H., M.D., M.R.C.P., Dean of the Institute of Child Health, University of London, in succession to Dr. W. G. Wyllie, who has resigned.

BIRTHS, MARRIAGES, AND DEATHS

BIRTHS

Ashwell.—On March 20, 1949, at The Willows Nursing Home, Bramley, Leeds, to Evelyn (née Hogg), wife of Dr. Colin S. Ashwell, Sharlston Common, Wakefield, twin daughters (premature)—Elizabeth and Susan.

Whalley.—On March 21, 1949, to Dr. Annette Whalley (née Brooks), wife of Dr. Hugh Whalley, 21, Burton Crescent, Leeds, a son.

MARRIAGE

Havelock—Buck.—On March 19, 1949, at Ealing Methodist Church, Brian J. R. Havelock to Joyce M. Buck, M.B., B.S.

DEATHS

Armstrong.—On March 28, 1949, at Royal Free Hospital, London, W.C., Kathleen Jane Armstrong, M.R.C.S., L.R.C.P.

Brown.—On March 24, 1949, at Pau, B.P., France, Francis Leonard Brown, M.D., aged 84.

Brown.—On March 22, 1949, at Ramsgate, John Brown, M.R.C.S., L.R.C.P., formerly of Flixton and North Wales.

Budden.—On March 25, 1949, at Staneside, Roman Road, Dorking, Tice Fisher Budden, M.D., aged 82.

Cawston.—On March 19, 1949, at 345, Vause Road, Durban, Natal, South Africa, Frederick Gordon Cawston, M.D.

Clayton.—On March 21, 1949, Thomas Morrison Clayton, M.D., D.P.H., of Gateshead.

Coates.—On March 23, 1949, at 22, College Gardens, Belfast, Foster Coates, M.D., D.P.H., aged 67.

Fagge.—On March 26, 1949, at the War Memorial Hospital, Melton Mowbray, Robert Hilton Fagge, M.R.C.S., L.R.C.P., J.P., aged 77.

Fraser.—On March 27, 1949, John Henry Pearson Fraser, D.S.O., M.C., M.B., B.Ch., of Jersey, previously of Southampton, aged 76.

Green.—On March 26, 1949, at 22, Church Street, Prescot, Lancs, Samuel Morris Green, M.R.C.S., L.R.C.P., D.P.H., aged 72.

Hill.—On March 9, 1949, James Lorrimer Hill, M.B., B.Ch., D.P.H.

Legge.—On March 26, 1949, as the result of an accident, Sydney Buxton Legge, M.D., J.P.

Pennefather.—On March 25, 1949, at 79, Portswood Road, Southampton, Victor Damian Pennefather, M.R.C.S., L.R.C.P.

Stoker.—On March 21, 1949, at Guy's Hospital, London, S.E., George Morris Stoker, M.R.C.S., L.R.C.P., of 7, Streatham Road, Mitcham, Surrey, aged 50.

Thambiah.—On Feb. 18, 1949, Rao Bahadur Capt. Saravanamuttu Thambiah, M.C., F.R.C.P.Ed., D.T.M.&H., F.D.S.

Thomas.—On March 22, 1949, at Brampton Kinlet, Canford Cliffs, Bournemouth, Frank Griffith Thomas, M.B., B.Ch., late of Maes-yr-Haf, Swansea, aged 76.

Ward.—On March 23, 1949, suddenly, while walking home, George Stafford Ward, M.B., B.S., of 12a, Malford Court, London, E.

West-Watson.—On March 20, 1949, at Victor Lodge, Manningham, Bradford, William Norman West-Watson, M.D.

Wood.—On March 27, 1949, at 684, Lordship Lane, Wood Green, London, N., Frederic Charles Wood, L.M.S.S.A., D.P.H., aged 83.

Young.—On March 24, 1949, Harold Godfrey Young, M.B., Ch.B., of North Goldings, St. Albans Road, Hatfield, Herts.

Any Questions?

Correspondents should give their names and addresses (not for publication) and include all relevant details in their questions, which should be typed. We publish here a selection of those questions and answers which seem to be of general interest.

Pethidine, "Trilene," and Chloroform in Labour

Q.—*I have found that pethidine by injection, followed by "trilene" given with a Freedman inhaler, is not sufficient in every labour to overcome the pain during birth of the head. Is it safe to follow pethidine and trilene with a small amount of chloroform?*

A.—Pethidine is an antispasmodic and analgesic drug which has proved valuable in relieving pain and aiding relaxation in the early stages of labour. Its great advantage is that there is little if any effect in depressing respiration in the baby. Trilene, or trichloroethylene, is similar in its action to chloroform and the two are not incompatible. There is thus no reason why pethidine and trilene should not be combined with a small amount of chloroform during the birth of the head; this combination should be perfectly safe provided only small amounts of both trilene and choloroform are used.

The Royal College of Obstetricians and Gynaecologists, in its report on trilene as an analgesic for childbirth, was unable to recommend that midwives working alone should give trilene through the Freedman inhaler, which was used in the extensive trials on which the report is based. The chief risk is of overdosage; it is shown in the report that shaking the bottle or a rise in temperature in the room causes a great increase in the amount of trilene received by the mother, and that there is consequently a real danger of overdosage and of the occurrence of surgical anaesthesia. These facts should be borne in mind when using trilene for analgesia in midwifery. It is important not to allow a too prolonged use of the Freedman inhaler and to see that overdosage does not occur. For some comment on the report of the Royal College of Obstetricians and Gynaecologists see *Journal*, March 26, p. 537.

Effect of Flying on Pneumothorax

Q.—*A patient who had an artificial pneumothorax induced nine months ago wishes to fly to South Africa. Are there any contraindications, and should any special precautions be taken?*

A.—When a patient with an artificial pneumothorax ascends to high altitudes he may become short of breath owing to the increase in volume of the air in the enclosed space of the pleural cavity which occurs as the atmospheric pressure is reduced. It is therefore advisable for such a patient to undertake the journey by air just before a refill is due, and to arrange for another refill as soon as possible after reaching his destination. From the work of Todd and of Lovelace and Hinshaw it may be stated that flying by persons with a pneumothorax should be discouraged until the lesion is reasonably quiescent. Where patients have to make frequent journeys by air, any pleural adhesion that is likely to rupture should be divided and a reasonable time allowed to elapse before the flight is made. It is difficult to state the height to which a patient may fly with safety, but as a general rule it is wise not to exceed 6,000 ft. (1,800 metres), for it should be remembered that 1,000 ml. of air saturated with water vapour at 37° C. at sea level will become 1,500 ml. at an altitude of 10,000 ft. (3,000 metres). Allowance must be made for this change in volume if it is essential for a patient with a pneumothorax to travel by air.

Tender Swellings of the Heel

Q.—*What is the treatment for the painful gross thickening of the skin and subcutaneous tissues behind the heel seen in so many young women? What are the faults in the ready-made shoes which cause them?*

A.—These tender swellings behind the heel are usually due to inflammatory changes in and around an adventitious bursa behind the tendo Achillis, or in the bursa which is normally present between the tendo Achillis and the os calcis. The inflammatory changes result from friction of the tissues against

the shoe. In some cases there is a circulatory element in the aetiology, for the condition tends to be more troublesome in winter and is often associated with chilblains and allied disorders. In other cases there may be an irregular bony prominence at the posterior aspect of the os calcis which aggravates the trauma arising from friction. The faults attributed to ready-made shoes probably lie in the selection of size and fitting rather than in the design itself. Nevertheless there is sometimes a tendency for the back of the shoe to curve forwards rather too much at the top. This may lead to friction against the tendo Achillis during the flexion–extension movements of the ankle which occur during walking, for with each contraction of the calf muscles the tendon becomes tightened like a bow-string and is pressed backwards against the top of the shoe. Treatment should be conservative in the first instance: the principle is to relieve the friction caused by the shoe. This may be achieved by the use of protective pads of felt applied over the swelling; by raising the affected area of the heel above the shoe by means of a "sorbo" rubber pad beneath the heel; or by the wearing of soft-backed or cut-away shoes. These measures are usually adequate for the acute or subacute type of case; but, if the symptoms are chronic and persistently troublesome, operative treatment may be advisable. This consists in removal of the affected bursa, combined where necessary with trimming of the underlying bony prominence.

Treatment of Superficial Burns

Q.—*What is the most satisfactory treatment for superficial body burns in children with or without the formation of blisters? These often give much trouble through infection, although they cannot be considered serious enough for hospital treatment, especially in a widely scattered rural practice.*

A.—The difficulty about superficial body burns in children is almost entirely one of effectively and continuously covering them during the ten days or so required for healing. Without plenty of crêpe bandages, supplemented by thin strips of surgical strapping (or, better, a thin shell of plaster-of-Paris over the bandages), it is almost inevitable that such burns will become infected if blisters form—whatever the local application. Assuming that crêpe bandages and strapping are available, the burn should be first cleaned by gentle rubbing with cotton-wool soaked in 1% "cetavlon" solution, or soap and sterile water, then dried, smeared with penicillin cream (200 or 400 units per gramme) or with sulphanilamide cream, and covered with gauze and wool. If these dressings remain intact they should not be touched for ten days. If crêpe bandages are not available, and if the burn is not very large and is truly superficial, it will probably do best if the surface is dried up with tannic acid or silver nitrate; but this treatment should not be used if there is any doubt about the depth of the burning. Whatever treatment is adopted, the doctor or nurse should first put on a face-mask and should carefully wash his or her hands.

Deep X Rays for Oat-cell Carcinoma of Lung

Q.—*Would deep x-ray therapy help in an advanced inoperable case of oat-cell carcinoma of the lung in a middle-aged man? If this is inadvisable, is any alternative treatment available?*

A.—There is considerable disagreement among radiotherapists about the value of deep *x*-ray therapy in an advanced case of oat-cell carcinoma of the lung. In the writer's opinion, in all except the most advanced cases palliative *x*-ray therapy should be attempted, and is often useful, especially to relieve pain. In a case such as this the radiotherapy should be planned as palliative, and it usually seems to be unwise to attempt radical *x*-ray therapy. Palliative *x*-ray treatment does not increase the length of survival, but clinically there can be no doubt of its usefulness in a substantial proportion of cases.

With regard to alternative therapy, the use of bis-nitrogen mustard by intravenous injection is sometimes of limited palliative value, especially in the more advanced cases, but it has the disadvantage of toxicity and the beneficial effects are very short-lived. The usual unit dose is 0.1 mg. per kilo of body weight, given in 10 ml. of normal saline intravenously, particular care being taken not to allow any solution to escape outside the vein. The best plan of dosage appears to be three or four unit doses on alternate days. It is desirable to arrange for daily blood counts during the course of injections, and then less frequently for the following four weeks. It is important to watch the haemoglobin concentration and the absolute lymphocyte count.

Auricular Fibrillation in the Elderly

Q.—*What is the best treatment for paroxysmal auricular fibrillation in a man of 64? Radiographs of the heart show no enlargement or disease, and the blood pressure is normal. The attacks are very incapacitating, although between them he is well.*

A.—Thyrotoxicosis must be excluded first, and this may not be easy. A specialist's opinion should be obtained. If it is reasonably certain that there is no known organic disease underlying the rhythm change, and if the nature of the rhythm change has been established as auricular fibrillation by electrocardiography, the only drug likely to prevent attacks is quinidine 3 to 5 gr. (0.2 to 0.32 g.) three times a day indefinitely. Auricular fibrillation in elderly subjects without apparent cause generally becomes persistent, and finally resists efforts to restore normal rhythm by means of quinidine. In such cases the condition is often best stabilized when permanent auricular fibrillation is accepted, and treated with a maintenance dose of digitalis if the ventricular rate is rapid, or left untreated if it is below 90.

Duration of Psycho-analysis

Q.—*Can you inform me if there is any recognized time limit for psycho-analysis? For example, if a stammer has been cured by this after, say, five years, may not continued treatment tend to foment introspection and a too great reliance on the psycho-analyst?*

A.—There is no specific time limit for psycho-analysis, and the extent of treatment depends on what is aimed at. The mere abolition of the symptom is often a simple process, and in some cases this is enough to break a vicious circle—for instance, in the case of a paralysed "shell-shocked" man whose paralysis is an unconscious desire to get out of the fighting but persists long after the war because it has produced a morbid autosuggestion that he cannot walk. If, therefore, he is made to walk by whatever means (persuasion, suggestion, or analysis), this may be sufficient to break the vicious circle, to abolish the morbid autosuggestion, and to fit the patient for ordinary civilian life. But it has to be remembered that the symptom is only an indication that there is something wrong with the personality and the patient's attitude towards life; in many cases, unless this is rectified, the patient is still ill adjusted and may relapse. That is why, even after the symptom is abolished, the analyst as a rule strives to produce a radical change in the individual's personality, so that he not only has no symptoms but is mentally healthy and capable of meeting all his responsibilities happily. In other words, the aim of treatment is not merely to abolish the symptom but to cure the morbid attitude in the personality which caused it and restore the patient to complete health. At the same time common sense must be brought to bear on the whole business. From one point of view the patient could be submitted to analysis all his life, as there are always residues of ill adjustment that might be corrected; not only so, but there are rare cases in which the individual prefers to wallow in his emotional state, and it is for the analyst to determine whether this is the case. The patient is of course not well so long as he is doing this, but merely to allow him to continue is not helping towards cure. The questioner would be well advised to seek for information from the psycho-analyst about the precise situation in the case he has in mind.

I.D.E. Test for Syphilis

Q.—*May I have details of the I.D.E. test used by the Nigerian Medical Services for the diagnosis of syphilis?*

A.—The I.D.E. test as originally described (*J. Lab. clin. Med.*, 1936, **21**, 1190) is carried out as follows:

To prepare the antigen, beef heart freed from fat, fibrous tissue, and blood vessels is finely minced, and 20 g. of this are mixed with 100 ml. of 95% alcohol and kept in a corked container in a water-bath at 60° C. for seven weeks; the mixture is shaken twice a day and finally cooled, filtered, and kept in a dark place. Fluid I is prepared by adding 0.2 g. of cholesterin to 10 ml. of this stock solution and warming for 10 minutes at 56° C.; Fluid II consists of

5% gum benzoin dissolved in the stock solution; Fluid III is a 1% alcoholic solution of crystal violet; and Fluid IV is a 1% alcoholic solution of azure II. For use in the test 100 ml. of Fluid I are added to 5 ml. of Fluid II and mixed; 1 ml. of Fluid III and 1 ml. of Fluid IV are mixed and 1 ml. of the resultant solution is added to the mixture of Fluids I and II. This constitutes the antigen. To carry out the test, place one drop (approximately 0.03 ml.) of the patient's blood in the concavity of a hollow slide, add one drop (0.05 ml.) of 3.5% saline and stir well, spreading it all over the surface of the depression. Prepare diluted antigen by adding 0.6 ml. of 2.5% saline to 0.2 ml. of the antigen, mix thoroughly by shaking, and add one drop (0.03 ml.) to the blood–saline mixture on the slide; place the slide on a flat surface and rotate vigorously for 3 to 4 minutes. The reaction is read by means of a microscope with a magnification of about 50, the examination being directed towards the periphery of the hollow in the slide: a positive reaction is indicated by purplish-blue-coloured clumps, the size of which is roughly proportional to the strength of the reaction. The slide should be covered with a slip and the reading carried out within 15 minutes.

Various workers have from time to time introduced modifications of the test. Thus, Rein and Hazay (*J. Lab. clin. Med.*, 1938, **23**, 954) found that the test was more sensitive if sera were heated; they used paraffin-ringed slides in preference to those with hollow depressions, and stated that 8 minutes was the optimum time for rotation. Timms (*E. Afr. med. J.*, 1945, **22**, 27) points out that, owing to evaporation in a hot climate, it is necessary to cover the preparation before shaking, and advises fixing the cover-slip with petroleum jelly or a rubber band. Presumably this precaution would be necessary in Nigeria.

Disseminated Sclerosis and Vaccination

Q.—*A patient with disseminated sclerosis was recently successfully vaccinated. This has been followed by a severe flare-up of her condition, so that she is unable to use a cup or even walk unaided. Is there any connexion between the two, and is there any drug which will alleviate her symptoms?*

A.—Exacerbations of disseminated sclerosis are likely to follow any acute systemic disorder, and they are known to be precipitated by injections of foreign proteins, particularly if these give rise to generalized disturbance. There is, however, no known connexion between the virus of vaccinia and disseminated sclerosis. The best way to help a relapse of this sort is to secure absolute rest in bed until recovery starts and then to institute re-education exercises.

Allergy to Fluorescent Light?

Q.—*Is there any evidence that allergy to fluorescent lighting exists? I have a patient who for the past 18 months has developed an urticarial rash after exposure to fluorescent lighting; she is free from it when she has not been so exposed.*

A.—The writer knows of no reference to urticaria from fluorescent lighting. Allergic urticarial reactions may follow exposure to ordinary daylight; it is, of course, localized to exposed parts. The light from fluorescent lamps shows a similar spectrum with some emphasis of the mercury lines (the source being mercury vapour) and some near ultra-violet radiation. A patient sensitive to such light in a physical sense should be sensitive to normal daylight.

Ectopic Gestation and Future Pregnancy

Q.—*A patient aged 30, with one child of 3½ years, had an operation for ectopic pregnancy three years ago. She now wants another child. (a) What are the best instructions to give her? (b) Are vitamin E or the hormones useful, and if so in what dosage? (c) What are the chances of conception? The other tube and ovary were normal when examined after the operation.*

A.—It is not clear from the question whether the recent relative sterility has been voluntary or involuntary. If the former, no special advice other than to practise coitus during the fertile period seems necessary. If, however, the patient has tried and failed to conceive, there is nothing in the history to indicate treatment with either vitamin E or hormones. Full investigation should be carried out; hysterosalpingography is especially important, for the tubal factor is likely to be concerned in the lowered fertility. The previous occurrence of tubal pregnancy (it is assumed that it was tubal in site and that salpingectomy was carried out) is itself evidence of disturbed tubal function, and the remaining tube may well be abnormal. Even if it is not, the removal of one tube lowers the chances of pregnancy by approximately one-half. When an ovum is produced by the ovary on the side of the previous operation (and this is likely to occur, on the average, during half the cycles), it can be fertilized and implanted only if it undergoes external migration. If, however, the ovary as well as the tube was removed at the previous operation the chances of pregnancy should be somewhat higher, because ovulation must then always take place in the ovary whose oviduct remains intact. For one reason or another only about 35% of women conceive again after once having an ectopic pregnancy. In the event of another pregnancy taking place the risk of its again being ectopic has been estimated at 1 in 10.

Psoriasis and Stilboestrol

Q.—*I have read an article on the treatment of psoriasis by stilboestrol. Is this a good method?*

A.—This is not a good treatment and has no rational basis, and should therefore not be employed. Endocrine factors sometimes enter into the aetiology of a particular case of psoriasis or a particular phase or type of eruption, as in menopausal cases. The indications for treatment and dosage then follow general lines.

NOTES AND COMMENTS

Deafness and Tinnitus.—Mr. W. H. B. MAGAURAN (London, W.1) writes: The answer to the question on deafness and tinnitus (Feb. 26, p. 378) gives the impression that labyrinthine fenestration is of little value in the relief of tinnitus in otosclerosis. This is not my experience, as I find that, if highly neurotic patients are excluded from operation, the prospect of the relief of tinnitus is good in otherwise suitable cases. Indeed, I have had cases of otosclerosis with fairly marked nerve deafness where troublesome tinnitus has been relieved by operation. The relief of a distracting tinnitus will, of course, in itself help the hearing. I have found that the relief of tinnitus, when it takes place, usually occurs soon after operation, but in rare cases it may be delayed for months.

As regards the relief of deafness, the answer given is that in many cases the restored hearing is lost from closure of the new fenestra or from serous labyrinthitis. I have found, however, that many cases retain the restored hearing; but in the event of the fenestra closing it can be readily re-established, at another operation, with restoration of the improved hearing. For example, one of my patients, in whose case the fenestra closed within a few months, has now excellent hearing a year after the re-establishment of the fenestra. Healing after such a reopening takes place in much less time than after the original operation, and I have noted that there is less vertigo.

The serous labyrinthitis mentioned is in my opinion caused by traumatic labyrinthitis, due to instrumentation or pressure of the dressing. This is not frequent in my experience, and its incidence should lessen in frequency as the skill and experience of the surgeon improve. The fact that the operation, in skilled hands, must be one of the safest in major surgery is also worthy of mention.

Calculi in a Paraplegic.—Mr. NORMAN GIBBON (Liverpool) writes: In your answer to the question on calculi in a paraplegic ("Any Questions?" Feb. 26, p. 377) you recommend the regular use of ammonium chloride to acidify the urine. I think it worth while to point out that this substance increases the urinary calcium output so that the solubility of the calcium salts may not be increased. On the other hand it has recently been shown by Cordonnier and Talbot (*J. Urol.*, 1948, **60**, 316) that the oral administration of acid sodium phosphate (5.8 g. a day) to such cases reduces the urinary output of calcium by about 50%, in addition to lowering the *p*H. It would seem that this is the drug of choice in these cases.

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